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HISTORY OF THE NAUTILUS.

In answer to numerous inquiries, it has been deemed advisable to give a brief historical sketch of THE NAUTILUS and its predecessor *The Conchologists' Exchange.*

The present conchological periodical "THE NAUTILUS" was preceded by "*The Conchologists' Exchange,*" a monthly published by Mr. Wm. D. Averell. The first number of the *Exchange* was printed on a postal card in July, 1886. Beginning with August, 1886 the *Exchange* was printed in 12 mo. form, 5½ x 6¼ inches, with a varying number of pages. Eleven numbers (Nos. 9 and 10 being printed together as a "double number") were issued of this first volume. The second volume began with July, 1887. Nine numbers were issued, when publication was suspended.

In May, 1889, Mr. H. A. Pilsbry with Mr. Averell issued the first number of THE NAUTILUS. The new periodical assuming the unexpired subscriptions on the list of the "*Exchange.*" At the completion of volume I (including May, 1889 to April, 1890), Mr. Chas. W. Johnson purchased Mr. Averell's interest in THE NAUTILUS, Mr. Averell entirely severing his connection with it.

The present publishers of THE NAUTILUS are unable to furnish copies of "*The Conchologists' Exchange.*"

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C. W. JOHNSON, Acting Curator Wagner Institute of Science.

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The Nautilus.

Vol. iv. MAY, 1890. No. 1.

Editorial.

With this number of the Nautilus we call the attention of our subscribers to a change in the proprietorship of the journal: Mr. Averell, heretofore its business manager, having retired, and entirely withdrawn his interest in the paper.

The editor has now associated with him, Mr. Charles W. Johnson, acting curator of the Wagner Free Institute of Science, Philadelphia. To the majority of American conchologists Mr. Johnson needs no introduction. It is a pleasure to the editor to be able to announce that he has secured the coöperation of so efficient a colleague.

All communications of a business nature should be addressed to Mr. Johnson. Contributions to the pages of the Nautilus may be sent to either Mr. Johnson or to the Editor, at the addresses given on the title-page.

After the first two numbers, the Nautilus will be issued *on the first of each month*. It is our intention to insure the prompt receipt of each number by our subscribers.

It is the purpose of the proprietors to publish articles of interest to beginners in the study as well as to experienced conchologists. The next number will contain an illustrated paper of great interest on *Haliotis* by Prof. Josiah Keep; the continuation of Mr. Carpenter's valuable notes on Rhode Island shells; articles by Dr. Sterki, Mr. Hemphill, the Editor and others.

AN AMERICAN ANADENUS.

BY HENRY HEMPHILL.

Recently, on the Cuyamaca Mountains in San Diego County, California, I was fortunate in finding specimens of what proved to be a genus new to America. Submitting them to Mr. Binney and Mr. Cockerell, they agreed with me in referring these species to *Anadenus*, formerly known of only from the Himalaya Mts.

The genus is characterized thus by Binney in his Genera of Slugs —"Animal limaciform, subcylindrical, tapering behind; tentacles simple; mantle anterior, concealing an internal shell-plate; no longitudinal furrows above the margin of the foot, and no caudal mucus pore; a distinct locomotive disk; external respiratory and anal orifices on the right posterior margin of the mantle; orifice of combined genital system behind and below the right eye peduncle.

Internal shell-plate small, oval, flat, with posterior nucleus and concentric striæ.

Jaw with numerous ribs.

Lingual membrane with tricuspid centrals, bicuspid laterals and quadrate marginals."

The genus differs from *Prophysaon* by its posterior respiratory orifice, the position of the genital orifice and by its locomotive disk. It will, however, be remembered that Fischer considers *Prophysaon* a subgenus of *Anadenus*. The distinction between the two is slight, especially as regards the respiratory orifice. The living slugs found by me had it slightly posterior. In alcoholic specimens of this and many of the Prophysaons it is difficult to detect its true position, so nearly subcentral is it.

ANADENUS COCKERELLI, n. sp.

Length contracted in alcohol 13½ mill. Mantle 4½ long, 2¾ wide. End of mantle to end of body 8. Foot 2 wide. Foot with a locomotive disk, being distinctly differentiated into median and lateral tracts. Respiratory orifice slightly posterior, on right edge of mantle. Genital orifice below right tentacle. No caudal mucus pore. Locomotive disk narrow, only half the width of the lateral areas. Sides of foot wrinkled, but not differentiated from lateral areas, nor specially marked, the wrinkles being a continuation of the transverse grooves of the lateral areas. Mantle tuberculate rugose, oval in outline, bluntly rounded at either end, not grooved as in *Amalia*. Man-

tle free in front as far as respiratory orifice. Back rather bluntly keeled its whole length: rugæ rather flattened and obtuse, consisting of grooves inclosing mostly hexagonal lozenge-shaped spaces, which are themselves rugose. Color, uniform brown-black without markings, except some dark marbling on the lighter sides. The portion beneath and in front of the mantle is pale, and the head and neck have a gray tinge. Foot brown. Internal shell solid, easily extricated without breaking.

Cuyamaca Mountains, San Diego Co., California.

Jaw low, wide, slightly arcuate, ends blunt, anterior surface with about twenty wide, flat ribs, squarely denticulating either margin.

Lingual membrane short and narrow. Teeth 20–1–20, of which eight only on either side are laterals. Centrals tricuspid, laterals bicuspid, marginals quadrate, bluntly bicuspid.

I am indebted to Mr. Binney and Mr. Cockerell for assistance in preparing the above description.

TWO NEW SPECIES OF U. S. LAND SHELLS.

BY H. A. PILSBRY.

Zonites Shimekii Pilsbry. This is a larger form than *Zonites limatulus*, much less depressed. The specimens are from the *Loess* formation, at Iowa City, Iowa, collected by Prof. B. Shimek and the writer some years ago. Being fossil, they lack color and epidermis. The sculpture is similar to *Z. limatulus*.

Alt. 3, diam 6 mill.

Pupa syngenes Pilsbry. Shell subcylindrical but wider above, composed of 8 narrow, convex whorls, *sinistrally convoluted*; texture as in *P. muscorum*, but color rather lighter brown. Last whorl ascending, imperforate, bearing a strong high crest just behind the outer lip. Aperture shaped as in *muscorum*, having a single small parietal denticle. Alt. $3\frac{1}{4}$, diam. $1\frac{2}{3}$ mill.

Two specimens of this form are before me, and I am in doubt whether to give them a new name, as they may be only sinistral monstrosities of the common *P. muscorum*. The shells are labeled "*Arizona*" in the Academy collection, collector not known.

[Since the above paragraphs were in type, I have received a communication from my friend Dr. V. Sterki, to whom I sent a speci-

men of *P. syngenes*, which I at first described as a variety of *muscorum*. He says:

"I am satisfied that it is a species, and not a var. of muscorum: the shape of the whole shell, the last whorl so considerably flattened, and ascending, the number of whorls, seem to me to prove its specifical rank. * * * After washing out the aperture of your specimen I saw a rather strong lamella or tooth on the columella, and a barely perceptible trace of an inter-palatal lamella, which however is validified by the impression on the outside."]

ANNOTATED LIST OF THE SHELLS OF ST. AUGUSTINE, FLA.

BY C. W. JOHNSON.

Teredo nivalis L.

Pholas campechiensis Gmel. Single valves are common on the ocean beach but living examples are rarely found.

Pholas costata L. Common.

Pholas truncata Say. A few specimens in the hard mud on Anastasia Island.

Martesia cuneiformis Say. Common burrowing into coquina wood, etc.

Solen americana Gould. Not common and smaller than those from more northern localities.

Solen viridis Say. A few specimens.

Glycimeris reflexa Say. One specimen with both valves intact was found on a bar in the harbor.

Glycimeris americana Conr. (G. bitruncata Conr.) Single valves are occasionally found on the ocean beach—apparently recent.

Mya arenaria L. A few single valves.

Corbula contracta Say. Common.

Mactra solidissima Dillw. var. *similis* Say. Common.

Mactra lateralis Say. Common.

Mactra braziliana Lam. (M. oblonga Say.) Not common.

Labiosa lineata Say. A few single valves on the ocean beach.

Labiosa canaliculata Say. Common.

Semele orbiculata Say. Common.

Abra aequalis Say. Common.

Cumingia tellinoides Conr. Not common.

Tagelus gibbus Spengl. Common.

Tagelus devisus Spengl. Common.

Tellina alternata Say. Common.

Tellina polita Say. Common.

Tellina tenera Say. Common on the bar below the United States Barracks.

Tellina braziliensis Lam. A few single valves.

Macoma tenta Say. Not common.

Macoma constricta Brug. A few single valves.

Donax variabilis Say. Common.

Donax obesa d'Orb. Common at the mouth of the Lagoon.

Petricola pholadtiformis Lam. Common.

Petricola typicus Jonas. One specimen from a coquina rock at Matanzas Inlet.

Venus mercenaria L. Common.

Venus cancellata L. A few single valves.

Callista gigantea Gmel. Not common.

Dosinia discus Reeve. Common.

Cyrena carolinensis Bosc. Common in small brackish-water streams.

Sphærium partumium Say. Common in Moultrie Creek.

Sphærium contractum Prime. A few near St. Mark's pond.

Cardium magnum Born. Common.

Cardium muricatum L. Not common.

Lævicardium serratum L. Rare.

Chama arcinella L. A few single valves.

Chama macrophylla. Not common.

Lucina dentata Wood. Common.

Lucina crenulata Conr. Not common.

Loripes edentula L. Large single valves are quite common but living examples are rare.

Solemya velum Say. Two specimens.

Parastarte triquetra Say. Not common.

Cardita tridentata Say. Not common.

Unio blandingianus Lea. Common in Cowan's Swamp. This is one of the Florida species that is able to survive a long time out of water.

Unio fuscatus Lea. Common in the upper part of Moultrie Creek.

Unio nigrinus Lea. Common in tributaries of the St. John's River west of St. Augustine.

Nucula proxima. Common.
Arca incongrua Say. Common.
Arca transversa Say. Common.
Arca pexata Say. Common.
Arca americana Gray. Common.
Arca ponderosa Say. Common.
Pectunculus sp.? Single valve.
Mytilus exustus L. Common.
Mytilus hamatus Say. Common.
Modiola tulipa L. A few small specimens.
Modiola plicatula Lam. Common.
Modiola lignea Reeve. Two specimens attached to Gorgonia.
Dreissensia leucophæata Conr. Common in brackish water.
Lithophagus appendiculata L. Common burrowing into Coquina.
Avicula atlantica Lam. Three specimens.
Avicula radiata Lam. One specimen attached to floating seaweed.
Pinna seminuda Lam. Common.
Pinna muricata L. Common.
Plicatula ramosa Lam. A few young specimens attached to coral.
Lima tenera Chemn. One living specimen.
Pecten dislocata Say. Living examples are rarely found.
Anomia ephippium L. Common.
Ostrea viginica Gmel.
Ostrea equestris Say.
Ostrea frons L. One specimen attached to Gorgonia.
Glottidia antillarum var. *pyramidata* Stimp (*Lingula*). A specimen taken near the old light-house is in a private collection.

WHY DOES PROPHYSAON SHED ITS TAIL?

BY W. J. RAYMOND.

While reading the March "Nautilus" my attention was directed to the foot-note on page 126, in which is related Mr. Hemphill's extraordinary experience with a specimen of Prophysaon. I have twice had a similar experience while handling living animals of the same genus, and think it may be of interest to record my observations.

In August, 1888, I collected on one occasion about a dozen examples of Prophysaon andersoni J. G. Cp., near the San José reservoir, above Lexington, Santa Clara County. While taking measurements of the living specimens, before putting them into alcohol, I noticed in several a contraction about two-thirds of the length from the head. This appeared as an indented line completely encircling the body. Upon handling the slugs to examine this phenomenon more closely, the line became deeper and in the case of two of the specimens the tail dropped off, almost as readily as the ray of the so-called "brittle" starfish. Only with mature slugs did this happen. The young, constituting the majority of those captured, showed no signs of shedding their tails. Perhaps they had further use for them. The discarded appendages showed vitality for a short time only, when they went to join their owners in my collecting bottle.

Again, only a few weeks ago, I collected on the northern boundary of Oakland some Prophysaon hemphilli Bl. & Binn. which together with Ariolimax Californicus and one of our smaller species of Ariolimax, inhabit a marshy spot near the Bay shore. At home the next day when taking my captives out of the can into which they had been put, I noticed the same contraction taking place in the specimens of Prophysaon, but in no case did it proceed to dismemberment. I put them into alcohol and in every one of them, seven in all, there is a well-marked, depressed line about the body near the tail, the body being attenuated behind the constriction, the whole looking very much as a soft iron wire looks just before it breaks under a tensile strain. In the largest specimen which measures 34 mm. contracted in alcohol, the depressed line is 8 mm. from the tail and is marked across the foot by a black line, as if the tissues were already almost severed. When collected there was no constriction visible.

In no other case have I observed this dropping of the tail among slugs, which seems as far as recorded to be confined to species of the genus Prophysaon. Here are the facts; who can explain them?

NOTES ON SOME NORTH AMERICAN PUPIDÆ WITH DESCRIPTIONS OF NEW SPECIES.

BY DR. V. STERKI.

On my request, Mr. H. Hemphill, of San Diego, Cal., was so kind as to forward to me, for examination, all the North American

Pupidæ in his possession. Among them there are a number of very interesting forms and varieties, as well as some species new to our fauna.

Pupa californica, Rowell.[1]

From Mr. Hemphill's material we learn that this species is variable to a very exceptional degree, so that the extreme forms appear to be, or to belong to, quite different species, or even genera. And it is more than probable that new specimens from other places will bring to light still more forms. The lots under consideration are the following:

1. *From San Francisco.* Several hundred examples of the well known form everywhere in collections. It may be regarded as typical, yet is somewhat variable in itself, as to shape of the shell and number and size of the lamellæ; many specimens are more or less oblong or obovate, while the majority are rather cylindrical; in some, the superior palatal lamella is very small and in a few even entirely wanting, while the apertural, columellar and inferior palatal seem to be constant, the first and last of them generally well formed, while the columellar may be small. In one specimen I saw a tiny but distinct supra-apertural, and in very many there is a small, nodule-like supra-apertural, close to the middle of the (outer side of the) apertural. So far I had thought this latter to be a special, distinguishing character of *P. rowelli*, Newc.

2. *From San Clemente Isl.* A little smaller and generally more cylindrical than the type; a part are even long cylindrical, having the appearance of an *Isthmia*. The coloration is somewhat paler, and the lamellæ are well formed—*elongata*. Among the more than 100 specimens there were 5 different from the balance, and ranging with the following form.

3. *From Santa Catalina Isl.* All the examples (about 200) are of quite a peculiar form: small, rather short, pale horn colored; shell thin, delicate; rib-like striæ less numerous and relatively larger; the whorls are less high, which gives the shell a different appearance. All lamellæ are present and well formed, especially the apertural. The shell is nearly exactly of the size and shape of

[1] Although I had ranged this species, with corpulenta, etc., among *Vertigo*, I prefer here leaving it once in the old place, on account of the varieties being so different from what we consider to be true *Vertigo*.

Vertigo bollesiana Morse, from New York or Ohio,[1] and also the lamellæ are much alike. One peculiarity is that in about one-third of the examples a part of the shell is wanting, always on the side of the aperture, so that 3 or even 4 whorls are opened. This can hardly be accidental, and probably that part of the thin shell is worn off by friction in moving. I would propose to name this form *var. catalinaria;* others might regard it as a species, as it appears to be rather well defined, and distinct from the other forms.

(*To be continued.*)

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

JUNE 4, 1890.

John H. Campbell, President, Philadelphia. *Cypraeidae.*

Charles W. Johnson, Secretary, Philadelphia. *South American Mollusca.*

Frank C. Baker, Philadelphia, Pa. *Muricidae.*

Rev. W. M. Beauchamp, Baldwinsville, N. Y. *Land and Fresh Water Shells of North America.*

Theodore G. Brinton, Philadelphia, Pa. *Mitridae.*

J. J. Brown, M. D., Sheboygan, Wis.

F. C. Browne, Framingham, Mass. *Nassidae and Strophia.*

H. F. Carpenter, Providence, R. I. *Shell-bearing Mollusca of Rhode Island.*

Prof. Wm. B. Clark, Baltimore, M. D. *Eocene Mollusca.*

Thomas C. Curry, Connersville, Ind. *Succineidae.*

Wm. H. Dall, Washington, D. C. *Abyssal Mollusks.*

Rev. A. Dean, Muncy, Pa. *Fusidae.*

Geo. W. Dean, Kent, Ohio. *Helicidae.*

James M. Delaney, Rochester, N. Y.

L. B. Elliott, Iowa City, Iowa. *Dentition.*

Frank J. Ford, Wichita, Kan. *Papidae.*

John Ford, Philadelphia, Pa. *Olividae.*

T. Marshall Fry, Syracuse, N. Y. *Unionidae.*

Uly. S. Grant, Minneapolis, Minn. *Land and Fresh Water shells of North America.*

---

[1] The New York and Ohio specimens of V. bollesiana are larger and more distinctly striate than those from New England and Canada.

I. Greegor, Jacksonville, Florida. *Tritonidae.*

C. A. Hargrave, Danville, Ind. *Unionidae.*

Geo. W. Harper, Cincinnati, Ohio. *Land and Fresh Water shells of North America.*

Dr. W. D. Hartman, West Chester, Pa. *Partula, Achatinella and Helicina.*

A. A. Hinkley, Dubois, Ill. *Strepomatidae.*

Prof. Josiah Keep, Mills College, Cal. *West Coast Shells.*

Rev. A. B. Kendig, Brooklyn, N. Y. *Amphidromus.*

F. R. Latchford, Ottawa, Ont. *Linnaeidae of North America.*

M. L. Leach, M. D., Wexford, Mich. *Mollusks of Michigan.*

W. Victor Lehman, Tremont, Pa. *Unionidae.*

G. D. Lind, St. Louis, Mo. *Helicidae.*

G. W. Lichtenthaler, Bloomington, Ill. *West Coast Shells.*

Wm. A. Marsh, Aledo, Ill. *Unionidae.*

Geo. T. Marston, Green Bay, Wis. *Wisconsin Mollusca.*

Chas. J. Maynard, Newtonville, Mass. *Strophia.*

Wm. G. Mazyck, Charleston, S. C. *North American Land Shells.*

Thomas Morgan, Somerville, N. J.

James H. Morrison, Lexington, Va. *Specific Variation.*

Wm. J. McGinty, Philadelphia, Pa. *Marginellidae.*

Philip Nell, Philadelphia, Pa. *Unionidae.*

H. A. Pilsbry, Philadelphia, Pa. *Land and Fresh Water shells.*

Wm. J. Raymond, Oakland, Cal. *West Coast Land and Fresh Water Shells and Tertiary and Quaternary Shells.*

John Ritchie Jr., Boston, Mass. *Strombidae.*

S. Raymond Roberts, Glen Ridge, N. J. *Cypraeidae.*

Edward W. Roper, Revere, Mass. *Cyrenidae.*

John Shallcross, Philadelphia, Pa. *Volutidae.*

Prof. Benj. Sharp, Philadelphia, Pa. *Dentaliidae.*

Ida M. Shepherd, Long Branch, Cal. *West Coast Shells.*

Prof. B. Shimek, Lincoln, Neb. *Ancylus and Succineidae.*

Chas. T. Simpson, Washington, D. C. *Geographical Distribution and Nomenclature.*

J. A. Singley, Giddings, Tex. *Land Shells of North America.*

Sanderson Smith, New York, N. Y. *Mollusca of N. W. Atlantic.*

Uselma C. Smith, Philadelphia, Pa. *Conidae.*

Dr. V. Sterki, New Philadelphia, O. *No. Amer. Pupidae and Hyalinia.*

L. H. Streng, Grand Rapids, Mich.

W. S. Strode M. D., Bernadotte, Ill. *Unionidae of Illinois R. and tributaries.*

Geo. W. Taylor, Stewarton, Ottawa. *Mollusca of Vancouver Province and Patellidae.*

John H. Thomson, New Bedford, Mass. *Helicidae.*

Bryant Walker, Detroit, Mich. *Land and Fr. W. Shells of No. America.*

Rev. John Walton, Lakeside, N. Y. *Cypraeidae.*

Henry A. Ward, Rochester, N. Y. *General Conchology.*

W. W. Westgate, Houston, Tex. *Land and Fr. W. Shells.*

Mrs. A. M. Whelden, Campello, Mass.

Prof. R. P. Whitfield, New York, N. Y. *Fossil Forms of the Mollusca.*

Joseph Willcox, Philadelphia, Pa. *Fulgur.*

Mrs. M. Burton Williamson, University Cal. *Haliotidae and Fissurellidae.*

S. Hart Wright, Penn Yan, N. Y. *Unionidae.*

Lorenzo G. Yates, M. D., Santa Barbara, Cal. *Land Shells of the Americas, South of the U. S.*

All applications for membership should be addressed to the Secretary, Charles W. Johnson, Wagner Institute, Philadelphia, Pa. The Rules of the Association were printed in the last number of the NAUTILUS.

NOTES AND EXCHANGES.

THE ORIGIN OF SPECIES.—The botanist Ball believes that species are produced by the successive variations of individuals continued through generations, and the subsequent dying out of the intermediate forms. In a recent address he refers to the *Escallonias* in this manner: "There are an immense number of forms of this genus in Chili, which would make first-class species if only the intermediate links would hurry and get out of the way." Anybody who has examined the Hemphill series of the *Helix strigosa* group cannot fail to notice how admirably the theory applies to that shell. And I believe that groups hardly less extensive can be made of the forms of *Sphærium striatinum*, *Unio complanatus*, the Michigan *Anodontas*

and other species. The American student of conchology has a broad field for work in his own country, and his researches will not be less valuable, if they result in a consolidation rather than an increase of species.—E. W. Roper.

Offered.—North American Land and Fresh-water shells for shells from other localities.—Thos. C. Curry, *Connersville, Indiana, P. O. Box* 366.

Offered.—Land and Fresh-water shells of Indiana for the same or marine species from any part of the world. *Unionidæ* preferred. Printed list of Hendricks County Shells sent free. Mounted lingual ribbons for microscopists.—Chas. A. Hargrave, *President of Central Normal College, Danville, Indiana.*

Limax arborum form submaculatus f. nov. Resembles var. *maculatus* Roeb., except that the spots are gray and partly coalesced on the body; and some black and some gray on the mantle. Found in County Waterford, Ireland, by Rev. A. H. Delap.—T. D. A. Cockerell.

Identification of Shells for Subscribers.—Specimens of North and South American (including Mexican and West Indian) shells will be named *for subscribers* on the following conditions:

1st. The number of species in one sending to be limited to 12.

2nd. The sender to pay all expenses of transportation, and the specimens to become the property of the Philadelphia Academy of Sciences.

3rd. Each species must be numbered, so that the identifications may be announced *by number* in this department of the Nautilus.

Address packages to H. A. Pilsbry, Academy of Natural Sciences, Philadelphia, or to C. W. Johnson, Wagner Institute, Philadelphia.

Helix introferens Bland has been collected by Mr. William Fox at Atco, N. J. (on the Camden and Atlantic R. R.). This species has not heretofore been noticed so far northward.—H. A. P.

Mr. Chas. W. Johnson, Junior Editor of the Nautilus, will spend the first half of June in Virginia, on a geological trip.

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.
ASSOCIATE EDITOR:
C. W. JOHNSON, Acting Curator Wagner Institute of Science.

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THE NAUTILUS.

VOL. IV. JUNE, 1890. No. 2.

THE HALIOTIS.

BY JOSIAH KEEP,
President Isaac Lea Chapter, Agassiz Association.

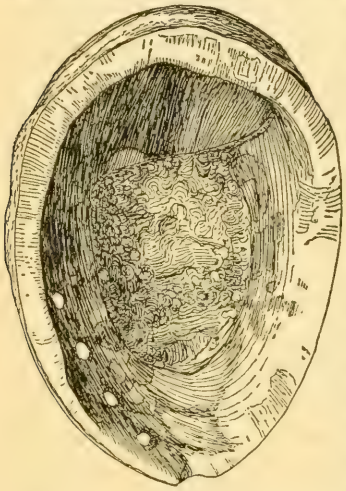
The Haliotis is the largest and finest Mollusk that is found on the coast of California. While its shell is a valuable article of commerce, its flesh is good for food, though perhaps few people except Chinese and Indians ever indulge in that luxury. I can speak from experience however, and am ready to affirm that "abalone soup," well made, is fit for the table of the most fastidious.

The Indians have nearly all disappeared from the coast now, but only a hundred years ago they were numerous enough, and for how many centuries before that time they had abounded in California is a question for the archæologists. Certain it is that along the shores where these mollusks now live there are untold numbers of Haliotis shells in all stages of decomposition. They were not washed up by the waves either, for they lie on the banks above the reach of the ocean. Besides this, stone mortars and other relics of savage men are occasionally found with the old shells. Evidently the Indians were accustomed to gather the mollusks from their haunts on the rocks and use their flesh for food. After the savage repast was over they threw away the beautiful shells.

This work went on for centuries, and to-day the railroad cuttings along the coast expose to view banks of mingled earth and pearl, several feet in thickness. It makes a conchologist's heart ache to find bushels of what were once magnificent specimens now all in ruins, and to think how little they were prized by those who had such excellent opportunities for collecting. But we will not blame them, poor sons of the forest; at least they knew how to satisfy their

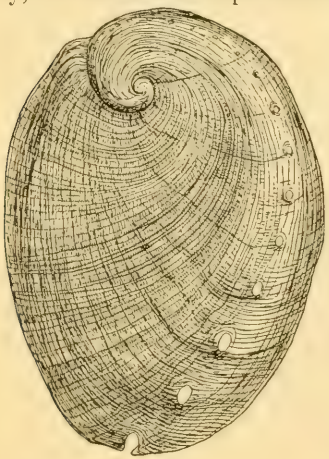
hunger in an approved manner, and sometimes they made ornaments from the discarded shells.

There are three species of Haliotis found in large numbers on the coast of California, though all three do not abound in the same locality. The southern species, *H. splendens*, is never found north of Monterey Bay, and I have seen only one specimen from that body of water. That one, however, was a genuine *splendens*, and I know almost the rock from which it was taken. I dissected the creature, which was evidently an aged individual, and the shell is now in my cabinet. This species is found abundantly farther south, around Santa Barbara and San Diego. It is really the most beautiful of the three, though its shell is too thin for some kinds of work. The magnificently mottled green pearl of the great muscle scar reminds one of the full glory of a peacock's expanded tail.



H. splendens.

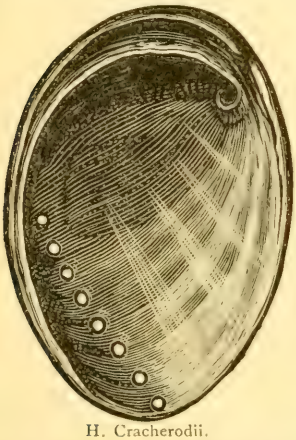
On the shores of central and northern California the other two species abound. *H. rufescens* sometimes has a shell as large as a dinner plate, but common specimens are only six or eight inches long. The outer layer of the shell is of a red color, while the inner or nacreous portion is beautifully iridescent. On account of their solidity, the shells of this species are specially fitted for making jewelry and pearl ornaments. These mollusks are captured by Chinese boatmen, who row along near the rocks, when the tide is low, and peer curiously down into all the cracks and clefts where these great creatures hide. When one is discovered, a wedge on the end of a pole is employed to suddenly dislodge the poor mollusk from his strong hold, and a boat-hook draws him up from the water into the hands of his enemy.



H. rufescens.

The third species, *H. Cracherodii* is the most common of all and is also the smallest, though it some-

times assumes noble proportions. You can find them under stones or in out-of-the-way places among the rocks if you search when the tide is low. All of these mollusks, in fact, are rock lovers, and it is idle to seek for them except among the crags or broken boulders. It is exceedingly interesting to capture a good-sized fellow and watch his mode of locomotion. When placed on a smooth rock he moves along at no snail's pace, but strides on like an elephant. Not quite so fast, to be sure, but the motion of his body, slightly swaying from side to side, and the tremendous muscular force which he evidently exerts cause one to involuntarily compare his gait to that of the great proboscidian. And as for that matter, our mollusk also has a thick, black proboscis, of no mean proportions.



H. Cracherodii.

The Haliotis, in short, is the noblest mollusk of our coast, if not of America. Of prodigious muscular power, quick and active in movement, guided by keen instincts, supplying nourishing food to man, and above all yielding a shell beautiful as the rainbow, it deserves an honorable place in the list of our important genera.

Very fine green pearls, almost rivaling the product of the pearl-oyster are sometimes taken from its mantle, and when its superior organization is considered, it is certainly far in advance of its headless neighbor. Every young collector should be sure to get good specimens of California "abalone" shells and those who are fortunate enough to visit the haunts of these creatures should endeavor to learn more of their habits, and observe their curious structure and interesting movements.

NEW VARIETIES OF PATULA STRIGOSA.

BY HENRY HEMPHILL.

Patula strigosa var. carnea.

Shell umbilicated, greatly depressed, dark horn-color, rather solid, shining, surface somewhat uneven and covered with irregular

oblique striæ; whorls 5½, convex, the last faintly subcarinated in the depressed specimens, falling in front, sometimes faintly banded, but most of the specimens are plain and without bands; spire subconical, apex obtuse, suture well impressed, umbilicus large; aperture circular; lip simple, thickened, its terminations well approached and joined by a callus.

Height ⅝ inch, greater diam ¾, lesser ¾ inch. Habitat, near Salt Lake, Utah.

Patula strigosa var. picta.

Shell umbilicated, elevated or globosely depressed, of a dirty white color, stained more or less with chestnut; surface somewhat rough and uneven, covered with moderately coarse oblique striæ and fine revolving lines; whorls 6, convex, subcarinated, with a broad white band at the periphery and a dark zone of chestnut on the upper side, extending from the peripheral band to the suture, fading out as it traverses the whorls of the spire; beneath on the base of the shell it is striped with numerous bands that sometimes extend into the umbilicus and also into the aperture; spire elevated; apex obtuse, suture well impressed, umbilicus moderately large and deep, broader in the depressed than in the elevated forms; aperture nearly circular, lip simple, subreflected, its terminations approaching and joined by a thin callus.

Height ⅞ inch, greatest diam. 1⅛ inch, lesser 1 inch.

Habitat, Rathdrum, Idaho.

Patula strigosa var rugosa.

Shell umbilicated, elevated or globosely depressed, of a dull brown ash color; surface rough, covered with coarse irregular oblique striæ, and microscopic revolving lines; whorls 5, convex, with or without one or two narrow faint revolving bands. In most of the specimens the bands are obsolete; spire elevated, obtusely conical; suture well impressed; umbilicus large, deep; aperture nearly round, lip simple, thickened, its terminations approaching and joined by a thin callus.

Height of the largest specimen ¾ inch, greatest diam. 1 inch.

Height of the smallest specimen ½ inch, greatest diam. ¾ inch.

Habitat, New Brigham City, Utah.

A large rough robust form with very convex whorls; some of the specimens so closely resemble H. solitaria Say, that one not well acquainted with both forms would be easily deceived and refer it to that species. In its adolescent state the lip is very thin or easily

broken, and on the surface of the adult shells these fractures give it a rough and uneven appearance.

Patula strigosa var. parma.

Shell broadly umbilicated, greatly depressed, of a dark dirty horn color, surface somewhat rough, covered with coarse irregular striæ, and microscopic revolving lines; whorls 5½ or 6, subcarinated throughout, somewhat flattened above, rounded beneath, and striped with two chestnut-colored bands, one above and the other just at the periphery; spire very little elevated, umbilicus moderately large and deep; aperture ovately round, oblique; lip simple, subreflected, its terminations approaching and joined by a thin callus.

Height ½ inch, breadth 1 inch.

Habitat near Spokane Falls, Washington.

Patula strigosa var. hybrida.

Shell umbilicated, depressed, white, spire horn-color, surface of the shell covered with fine oblique striæ, and widely separated revolving raised lines; whorls 5, flattened above, rounded beneath, the last falling in front, and striped with two faint chestnut bands, suture well impressed; umbilicus large, showing nearly all the volutions; aperture nearly circular; lip simple, thickened, its terminations approaching and joined by a thin callus.

Height ⅜ inch, diam. ¾ inch, lesser ⅝ inch.

Habitat near Logan, Utah.

This is an interesting shell as it is the beginning of the forms of *strigosa* that finally develope the revolving lines into prominent ribs as seen on the surface of var. *Haydenii* Gabb.

Patula strigosa var. albida.

Shell broadly umbilicated, greatly depressed, white, tinged with horn color; surface covered with fine oblique striæ and fine microscopic revolving lines; whorls 6, convex, the last falling in front; spire very little elevated, apex obtuse, aperture oblique, nearly round; lip simple, thickened, subreflected at the columella, its terminations approaching, joined by a thin callus.

Height ½ inch, greatest diam. 1 inch, lesser ¾ inch.

Habitat near Logan, Utah.

Patula strigosa var. fragilis.

Shell umbilicated, elevated or globosely depressed, translucent, thin, fragile, somewhat shining, of a dark horn color, surface covered by fine oblique striæ; whorls 5, convex, the last descending in front, and

striped by two dark chestnut bands, one above and the other below the periphery; suture well impressed; aperture oblique; lip simple, thickened, umbilicus moderate, deep, partially covered by the reflected lip at the columella.

Height of the largest specimen $\frac{9}{16}$ inch, greatest diam. $\frac{7}{8}$ inch, lesser $\frac{3}{4}$ inch.

Habitat near Franklin, Idaho, among Red Sandstone.

A very thin and almost transparent variety of the very variable *strigosa*. By its peculiar shade, it is very evident that the animal has drawn largely from the red sandstone for the material to build its shell.

NEW FORMS OF AMERICAN PUPIDÆ.

BY DR. V. STERKI.

Pupa Californica, varieties, continued.

4. *From Monterey, Cal.* In size not much different from the type, yet a little smaller, and more generally obovate; the striæ are less coarse; the peristome is slightly but distinctly expanded. There is no superior palatal lamella, and the three present ones are small, the columellar even a trace or wanting entirely. The form may be named: *var. trinotata.*

5. *From San Diego, Cal.* The diminution of the lamellæ is going on; none but the apertural is left in this variety—*diegoensis*—and that even is quite small or a mere trace. In size and shape, the examples are not much different from the Monterey form, which is an intermediate one. In the relation of var. *diegoensis* and the very distinct var. *catalinaria*, and also *elongata* on the neighboring islands, there is a zoogeographical enigma, which may be solved in connection with other facts.

6. *From Rocklin, Cal.* (Placer Co. 25 Ms. N. E. of Sacramento.) Large, conic or ovate conic, or turriculate, umbilicated, rib-like striæ rather strong; whorls 5, well rounded, with deep suture, the last occupying more than $\frac{1}{2}$ altit.; aperture subovate or nearly circular, margins much approximate and the ends protracted, peristome shortly but decidedly expanded; lamella one, apertural, small. Alt. 2, 5; diam. 1, 5 mill. For its size, rounded aperture and single lamella I would name this form var. *cyclops.* It is with some doubt

that I refer this form to *P. californica:* it might just as well be regarded as a distinct species. But for that there will be time if no intermediate and connecting forms be found.

It will be of special interest to examine and compare the soft parts of all these varieties or forms, anatomically as well as to the mode of life.

Some conchologists may consider it to be useless or even worse to apply varietal names to the forms described above; but we must try to arrange them systematically as naturally as possible, according to their relations among themselves and with kindred species; and for that purpose we must name them. And it is also for convenience: is it easier to say, in citing: "*that variety of P. californica inhabiting Santa Catalina and San Clemente Islands, much smaller than the type, with lower whorls, lighter coloration, relatively coarser striation, and well formed lamellæ,*" than simply designating it by a name?

Pupa Dalliana sp. nov.

Shell conic or ovate-conic, of greenish-horn color, transparent, finely irregularly striate in the lines of growth, polished; whorls 4½, well rounded, with deep suture, rather rapidly increasing, the last occupying about ⅔ of altit., towards the aperture somewhat ascending on the penultimate. Aperture lateral, somewhat oblique, subovate with just perceptibly flattened palatal margin; margins approximate, the ends protracted; peristome shortly but decidedly expanded, with a very fine thread-like lip near the margin, the same continuing as a very fine callus on the apertural wall inside of the line connecting the ends of the margins; palatal wall quite simple; no lamellæ.

Alt. 1. 2; diam. 1. 3 mill.

This form has been collected by Mr. Hemphill near Clear Lake, Lake Co., Cal., and I propose to name it in honor of Mr. Wm. H. Dall. The specimens before me were fifteen, fresh, remarkably uniform in their whole appearance; all were more or less covered with a dark brown, hard crust of slime and dirt, generally thickest around the aperture. Doubtless this coating is done "purposely" by the animals, as in many other species also. When cleaned, it shows about the size and shape of a well-grown *Vertigo ovata*, Say, but by a good eye or under a glass is at once recognized as something else, by the rounded aperture and the absence of lamellæ.

DISTRIBUTION OF UNIONIDÆ IN THE THREE RIVERS, MAHONING, CUYAHOGA AND TUSCARAWAS.

BY GEO. W. DEAN, KENT, OHIO.

The table given below, while making no pretense to absolute accuracy, is a fair approximation of the distribution of Unionidæ in the three largest rivers and their tributaries in northeastern Ohio. Although they afford us no peculiar species, unless it be the *Unio Kirtlandiana* Lea of the Mahoning River, they still present some points of interest. The reader must bear in mind that species are not found equally distributed. Some may be found almost anywhere and others at only one place in a whole river. The Mahoning and Tuscarawas Rivers are tributaries of the Ohio; the first through the Beaver, the latter through the Muskingum. The Cuyahoga rises about thirty-five miles east of Cleveland and empties into Lake Erie at that city. Its course is southwest to within two or three miles of Akron from which it is almost due north to its mouth. Through this valley runs the Ohio canal, and this canal connects this river with the Tuscarawas by a rise that required sixteen locks, the whole distance between the two rivers being about six or seven miles. It will be seen by the following tabular statement that *Unio ligamentinus*, *rectus*, *rubiginosus* and others are common to the Tuscarawas and lower Cuyahoga, and entirely absent in the Mahoning and upper Cuyahoga. Above the connection of the Cuyahoga with the canal are several falls above which are found only five or six species, but below there the number is largely increased by those named above and a number of other Tuscarawas forms. The interesting question presented is, have these Tuscarawas forms been introduced through the canal during its fifty or sixty years of existence? A list of the forms found in streams that empty into Lake Erie, and have no connection by canal or otherwise with the Ohio, might throw some light upon the subject. In conclusion I will say that geographical distribution is of paramount importance to the conchologist and collector, and the least contribution to the limited knowledge of the subject we have at present ought to be welcomed.

Mahoning River,	Cuyahoga River,	Tuscarawas River.
	Anodonta.	
decora Lea,	.....	plana Lea?
subcylindracea Lea,	subcylindracea Lea,	subcylindracea Lea.
edentula Lea,	edentula Lea,	edentula Lea.
imbicilis Say (very rare),	?	?
pavonia Lea, Var.	pavonia Lea (typical) Above the falls.	pavonia Var.
	Margaratana.	
.....	.....	deltoidea Lea.
complanata Lea,	complanata Lea,	complanata Lea.
.....	(canal)	dehiscens Lea (rare).
Hildrethiana Lea, (rare)	.....	Hildrethiana Lea (rare).
marginata Say,	marginata Say,	marginata Say?
rugosa Barnes.	rugosa Barnes.	rugosa Barnes.
	Unio.	
.....	alatus Lea,	alatus? Lea.
circulus Lea,	circulus? Lea,	circulus Lea.
clavus Lam (common),	.....	clavus Lam (rare).
coccineus Lea,	coccineus Lea,	coccineus Lea.
cylindricus Say,	.....	cylindricus Say.
fabalis Lea,	.....	.....
gibbosus Barnes,	gibbosus Barnes,	gibbosus Barnes.
iris (rare),	.....	? ?
.....	.....	irroratus Lea.
.....	Novæeboraci Lea,	Novæeboraci Lea.
luteolus Lam.,	luteolus Lam.,	luteolus Lam (rare).
multiradiatus Lea,	multiradiatus Lea,	.....
.....	nasutus Say,	.....
occidens Lea, (subovatus)	occidens Lea (rare),	occidens (common)
parvus (reservoirs) Barnes,	parvus (reservoirs)	? ?
.....	.....	perplexus Lea (rare).
phaseolus Hild.,	? ?	? ?

pressus Lea,	pressus Lea,	pressus Lea.
.....	.....	pustulatus Lea (rare).
.....	.....	pustulosus Lea.
.....	.....	pyramidatus Lea.
rangianus Lea,	.....	rangianus Lea.
.....	rubiginosus Lea (common),	rubiginosus Lea. (common).
.....	rectus Lam.,	rectus Lam.
Kirtlandiana Lea,	.....	? ?
.....	? ?	subrotundus Lea.
triangularis Lea,	.....	triangularis Lea.
tuberculatus Barnes,	.....	tuberculatus Barnes.
undulatus Barnes,	.....	undulatus Barnes.
verrucosus Barnes (rare). Very large.	.....	verrucosus Barnes (rare).

THE SHELL-BEARING MOLLUSCA OF RHODE ISLAND.

BY HORACE F. CARPENTER.

FAMILY UNIONIDÆ.

189.—*Unio radiatus.*

Syns.:

Mya radiata, Gm. Dill. Wood.
Mya oblonga, Wood.
Lampsilis radiata, Stimp. Morse.
Unio Virginiana, Lam.
Unio radiata, modern authors.

Shell transversely oblong-ovate, broader and angular behind; beaks nearer the anterior extremity; epidermis concentrically wrinkled, olivaceous with numerous lines of a greenish color radiating from the beaks to the margin; nacre bluish-white, irridescent at the posterior portion, with flesh colored tints; cardinal teeth strong, erect, triangular pyramidal. Length 3 inches, height $1\frac{7}{10}$, breadth $1\frac{1}{3}$.

It inhabits ponds and rivers on the eastern slope of the Alleghanies and is quoted as being one of our most common species, but it is

not the case in Rhode Island, being extremely local, though abundant where found at all. Up to October of 1872, it had never been collected in this State. I had frequently examined our various ponds and rivers with particular reference to this species, without success, but in riding past Mashapang Pond one day in October, I noticed that the water was extremely low, and on going down to the edge of the pond I saw numerous tracks of Unios in the sand, and among them were some which seemed a little different in shape from those made by the U. complanatus. On following up these tracks (some of them eight or ten feet in length) I found at the end of each, burrowed in the sand, the long-looked for *radiatus*.

Genus *Margaritana*, Schum., 1817.

Shell transverse, inequilateral; hinge like that of Unio, but destitute of lateral teeth. There are forty species, three of which inhabit Rhode Island.

(*To be continued.*)

PUBLICATIONS RECEIVED.

THIRD SUPPLEMENT TO FIFTH VOLUME OF TERRESTRIAL MOLLUSKS OF THE UNITED STATES. By W. G. Binney. (Ex. Bull. Mus. Comp. Zool., vol. xix, pt. 4, May, 1890.) This Third Supplement equals our expectations, in fully sustaining the author's reputation for careful and reliable work. In it are described and figured the species of land mollusks made known since the publication of the Second Supplement. Mr. Binney, while not departing from that wise conservatism, in regard to specific limitations, which has made his successive volumes models of careful systematic work, devotes more space than formerly to the important subject of variation. Geographical distribution also has much attention. The species and varieties figured and described are as follows: *Zonites minusculus var. Alachuana* Dall (Florida), *Succinea chrysis* and *annexa* Westerlund (Alaska), *Zonites ligerus var. Stonei* Pilsbry (Del.), *Z. Sterkii* Dall (Ohio), *Pupa Holzingeri* Sterki (Minn., Ill.), *Zonites Singleyanus* Pilsbry (Texas), *Z. Dallianus* Simpson (Fla.), *Microphysa? dioscoricola* Ad. (Fla.), *Polygyra auriculata var. microforis* Dall (Fla.), *P. Jacksoni var. deltoidea* Simpson (Ind. Ter.), *Mesodon Kiowaensis* Simpson (Ind. Ter.), *Acanthinula granum* Strebel &

Pfeffer (Fla.), *Onchidium floridanum* Dall (Fla.), *Limax Hemphilli* W. G. B. (Cal.), *Arion foliolatus* Gould (a species of *Prophysaon*), *Prophysaon cæruleum*, *fasciatum*, *Pacificum*, *flavum* and *humile* of Cockerell, *Polygyra Roperi* Pilsbry (Cal.), *Patula strigosa vars. subcarinata*, *jugalis* and *Buttoni* Hemphill, *Zonites selenitoides* Pilsbry, *Z. Simpsoni* Pilsbry, *Pupa calamitosa* Pilsbry, *Helix tudiculata var. Binneyi* Hemphill, *Helicodiscus fimbriatus var. Salmonensis* Hemphill (Idaho & Oakland, Cal.). The discussion of the *Helix major-albolabris-andrewsi* group, and of the western slugs of the genera *Hemphillia* and *Prophysaon* are of great interest. The contribution to the literature of our slugs is particularly timely and valuable. Mr. Binney considers *Bulimulus Hemphilli* Wright a synonym of *B. Floridianus* Pfeiffer. The plates, 10 in number, are admirably drawn and printed; six of them illustrating slugs. The original drawings are by Binney, A. F. Gray, T. D. A. Cockerell and A. H. Baldwin. There are also numerous wood-cuts in the text. Whilst we would perhaps take exceptions to certain minor details of Mr. Binney's classification, the work as a whole, is certainly very creditable to the distinguished author.—*H. A. P.*

GENERAL NOTES.

Helix hortensis in Nantucket. Dr. Harrison Allen of Philadelphia, whose summer home is at the picturesque little village of Siasconset, on the island of Nantucket, has presented me with four specimens of *H. hortensis* taken there by him;—the only ones he has seen. This is the most southerly locality for this species yet known. I am not inclined to believe it a native American, as Mr. Cockerell thinks, but would rather regard it as an immigrant, who has come over, like the rest of us, in comparatively recent times, and is gradually extending its range. Two of the specimens are yellow, one with 4, the other with 5 brown bands; one shell is uniform yellow (form *lutea* Moq.); one is yellow with 5 *translucent*, almost colorless bands, the lower two very wide, almost coalescent.—H. A. Pilsbry.

Species determined. From E. W. Roper, Revere, Mass.

1, Nerita fulgurans Gmel. 2, Perna ephippium Lam. 3, Columbella nitida Lam. 4, Conus mus Hwass. 6, Litorina ziczac Dillw. 7, Cerithium minimum Gmel. 8, Modulus Floridanus Conr. 9, Ricinula nodulosa Ad. 10, Purpura deltoidea Lam. Locality, Vera Cruz, Mex.—*H. A. P.*

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR:
H. A. Pilsbry, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.
ASSOCIATE EDITOR:
C. W. Johnson, Acting Curator Wagner Institute of Science.

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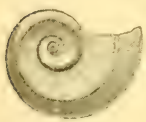
THE NAUTILUS.

VOL. IV. JULY, 1890. No. 3.

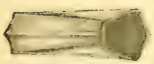
A NEW EOCENE FOSSIL FROM TEXAS.

BY T. H. ALDRICH, CINCINNATI, OHIO.

Omalaxis Singleyi n. sp.



Shell flat, smooth, tricarinate, one carina on each edge and one on the periphery of the body whorl; apex impressed; whorls four, but three showing above, suture deeply excavated, upper and lower part of whorls inclining toward suture. Mouth nearly quadrangular. Length 1mm.; breadth 3mm. Locality: Lee Co., Texas.



This is the second species now known from the Atlantic Eocene. The first was described by I. Lea from the Claiborne sand as "Orbis rotella." For the generic synonymy see Dall's "Report on the Mollusca," 1889, part 2, p. 276. Discovered by J. A. Singley, Esq., and named in his honor.

NEW FORMS OF WESTERN LIMNIADES.

BY HENRY HEMPHILL, SAN DIEGO, CAL.

Limnæa (Leptolimnea) Pilsbryi Hemphill.

Shell elongated, narrow, somewhat solid, smooth, of a light horn-color; consisting of about six roundly-shouldered whorls, the last flattened on its sides and occupying a little more than half the length

of the shell; lines of growth very delicate, suture deep; aperture oval, longer than wide, outer lip acute; inner lip subreflexed.

Length $\frac{3}{8}$, breadth $\frac{1}{2}$ of an inch.

Habitat: Fish Spring, Nevada.

I collected a few specimens of this interesting shell in the month of June, 1868, at this locality, after a long and hard day's ride of 40 miles horseback. Another long ride next day of 50 miles to water, compelled an early start and thus the opportunity to secure more specimens was lost.

Limnæa stagnalis var. occidentalis Hemphill.

Shell large, globose, very thin and fragile; of a light horn-color; whorls five, the last rapidly increasing in size and constituting about three-quarters the entire length of the shell and generally covered with revolving malleations separated by obtuse, irregular lines more or less conspicuous; lines of growth somewhat irregular and conspicuous; spire short, sharp and acute, consisting of three obliquely twisted whorls and the nucleus; suture well impressed; aperture globosely oval, longer than wide; outer lip thin, sharp, acute, subreflexed near its junction with the columella; inner lip sinuous and well defined, columellar strongly twisted.

Length of the largest specimen $1\frac{5}{8}$ inch, breadth 1 inch.

Habitat: Lake Whatcom, Whatcom Co., Washington.

There is considerable distortion in the fifteen or twenty specimens of this interesting variety that I found on the shores of the above lake in November, 1889. This shell would probably be considered new by many conchologists, but I regard this as simply a telescoped, so to speak, variety of the metropolitan stagnalis. It might be called with propriety the L. auricularia of America, and occupies a position midway between L. stagnalis and L. auricularia and creates a suspicion in my mind that the latter after all is but a form of the former species. I found two living specimens in the lake. These I intended to have preserved in spirit, but not having a large mouthed bottle at hand I placed them in a box with some living Selenites Vancouverensis, intending to remove them before night; this I neglected to do and the next morning when I opened the box, I was horrified to find two of the largest Selenites, had their long white bodies inserted into the shells of their aquatic cousins and all that remained of the soft parts of my new-found treasures, was the tip end of their bodies in the last whorl of the spires of their shells.

Physa var. Columbiana Hemphill.

Shell globose or moderately elongated, shining, solid; of a dark horn, or chestnut color; whorls four, the last occupying about three-quarters the entire length of the shell; suture well defined and generally marked by a fine yellowish line; spire short, obtuse; aperture long and moderately wide; outer lip simple, thickened internally with a dark chestnut deposit that shows on the outside as a yellowish band; columella lip somewhat sinuous, and well folded on the body whorl.

Length of an elongated specimen $\frac{5}{8}$, breadth $\frac{5}{16}$ of an inch.

Length of a globose specimen $\frac{1}{2}$, breadth $\frac{5}{16}$ of an inch.

Habitat: Columbia River, Astoria, Oregon.

I collected nearly two hundred specimens of this shell at the above locality in the month of November, 1877. They were found adhering to the underside of stones that are submerged several feet during high tide, associated with Goniobasis plicifera var. bulimoides Tryon. On comparison with specimens of Physa ampullacea Gld. collected by me in Owens River Valley, in 1869, and a few specimens from the upper Columbia also collected by myself, I am satisfied this shell is a small or miniature form of that species and not a variety of Physella globosa Hald. as supposed by the late G. W. Tryon. There is considerable variation in the form of this shell, but there is no plication on the columella, the only character in the genus Physella worth noticing. My specimens of Physa ampullacea Gld. from Owens River Valley, are very large and globose, with the columella strongly twisted, and are fully as well qualified to enter the genus Physella as the present specimens.

NOTES ON SOME NORTH AMERICAN PUPIDÆ WITH DESCRIPTIONS OF NEW SPECIES.

BY DR. V. STERKI, NEW PHILADELPHIA, OHIO.

Pupa Hemphilli sp. nov.

In examining a lot of about 45 specimens named *P. calamitosa* Pilsb., from the banks of St Thomas River, Lower California, I found that there were two distinct forms in them. The author says, in his description of *P. calamitosa*:[1] "Several specimens have only one lamella on the outer lip and are rather larger than the

[1] The Nautilus iii, No. 6 (Oct., 1889).

typical form described," represented in Pl. I, fig 6 (l. c. No. 7). Probably I had a greater number of examples at disposition than Mr. Pilsbry; the two forms proved to be distinct by an entirely different formation of the lamellæ as well as of the basal part of the shell. And among the whole number I found not one intermediate or doubtful specimen. There is no doubt but that we have to consider them as being specifically distinct, the more so since they live together in the same locality. For the new species I would propose the name: *P. Hemphilli*, in honor of the man to whom we owe so many valuable additions to our malacological fauna.

As in shape and general appearance the two species are almost alike, it may be the best way to characterize the one in question by comparing it with *P. calamitosa*, Pilsb. *P. Hemphilli* averages a trifle larger than its companion, but either is somewhat variable in size. While *calamitosa* has a minute perforation, *hemphilli* is umbilicated in quite a peculiar way: there is a nodule-like projection on the umbilical part of the last whorl producing a rima beside the umbilicus; in *calamitosa* there is nothing of this formation. On the other hand, the latter has a small but distinct groove-like impression just at the base, near the aperture appearing as a slight projection inside; this feature is wanting in *hemphilli*.— Lamellæ: in the latter species, when looking from front only one is generally seen in the palatal wall, corresponding to the superior one in *calamitosa*, but longer, *i. e.*, beginning deeper in the throat, and fairly seen on the outside, also marked there by a corresponding impression, ascending in a curve from near the base; a little distant from its inner end, just above the projection mentioned, there is another lamella beginning, directed toward the base and ending there, also seen on the outside. Quite generally there is a very small, thin, but well formed lamella in the palatal wall near the projecting auricle. The columellar fold is quite short and small in *hemphilli* yet consisting of a vertical and a horizontal part; the (main) apertural lamella is decidedly longer in our species, and the supra-apertural higher and entire while in *calamitosa* it is evidently composed of two parts marked by an indentation in the middle, or even entirely separated, in quite mature specimens.

About 20 examples, collected at San Diego, Cal., by Mr. Hemphill, are all *P. hemphilli*, no *calamitosa* among them. They are little different from the St. Thomas River specimens, except by a somewhat shorter palatal lamella.

REMARKS ON UROSALPINX PERRUGATUS CONRAD.

BY FRANK C. BAKER, PHILADELPHIA, PA.

This mollusk was described by Conrad in the American Journal of Science, New Series, vol. II, 1846, p. 397, as follows: "*Fusus perrugatus* Conrad. Manatee River. Fusiform, with remote longitudinal ribs, and large prominent revolving lines alternating with a fine line; whorls longitudinally rugose, upper half flat and oblique; aperture rather more than half the length of the shell, purple within; labrum striate; color of the exterior cinereous. Proportionally wider than *F. cinereus*, with fewer and larger ribs and lines."

The only references I have been able to find, which have been made to this shell since the foregoing description, are those by Dr. W. H. Dall in Bulletin No. 37 of the United States National Museum, p. 120, and in the Report on the Blake Gasteropoda, p. 214, in which he says: "There are three American species known to belong to it; (*Urosalpinx*):—*U. cinereus* Say, ranging from Massachusetts to Florida; *U. tampaensis* Conrad, known only from the west coast of Florida . . . . . lastly *U. perrugatus* Conrad."

Among the specimens of *cinereus* in the collection of the Academy of Natural Sciences of Philadelphia I found several trays of *perrugatus*, and as no really good description, and no figure has been published of this species, I take this opportunity of redescribing and figuring the same.

Urosalpinx perrugatus Conrad.

Shell fusiform, solid, cinerous, under the lens showing a scabrous texture; whorls six, subcarinated, longitudinally plicate, the folds eight in number on the last whorl, large, rounded; there are eighteen strong, spiral liræ, with fine intervening threads; aperture ovate, rather more than half the length of the entire shell; outer lip rounded, edge scalloped by the spiral liræ; inner lip arcuate, smooth; canal longish, open, reflexed; umbilicus none, but there is

a furrow in its place, bounded by a fasciole; aperture purple within; apex minute, knob-shaped, smooth.

Alt. 32, diam. 15 millimeters. Aperture (including canal) alt. 6, diam. 6 millimeters.

It is separated from *cinereus* by its greater proportional width, its stronger ribs and spiral liræ and more scabrous texture. It is at once separated from *tampaensis* by the sculpture; that of *tampaensis* being latticed by the intersection of the longitudinal and spiral lines; there are other differences which will at once distinguish it from that species.

Specimens have been collected at Cedar Keys, by Mr. Henry Hemphill, and I understand from collectors that it has been found elsewhere on the west coast of Florida.

PRESERVATION OF COLOR IN FOSSIL SHELLS.

BY CHARLES R. KEYES.

Recently some interesting fossils have come under my notice: *Trachydomia wheeleri* Swallow from the Coal Measures of Illinois. The group is a member of the Naticidæ, a family which in the American Palæozoic is also represented by several other genera. The shells alluded to, while Natica-like in general aspect, are rather small in size, massive, with the surface covered with numerous conspicuous nodes, and the callosity of the inner lip greatly thickened and extended. Among the specimens are a number in which the coloration of the callous portions and of the interior surface is still visible. In some individuals the color is an intense shining black; in some a purplish-black; in others dull faded purple; and in a few the color has entirely disappeared. Aside from the apertural parts all traces of the original coloration of the shell are lost. Apropos it may be mentioned that de Koninck has also called attention to examples of *Macrochilus* from the Carbonic of Belgium, having the maculate surface still apparent. The markings in this instance consist of series of large rectangular spots. And it is presumable that the shells of this Carbonic group were originally brightly colored and presented an appearance similar to many recent forms of the genera *Mitra* and *Conus*. In the Löss (post-pleiocene) deposits of the Upper Mississippi Valley there are some forty or more species of land and fluviatile shells known; the majority of which are still found living with-

in the limits of the region. Two terrestrial forms *Patula strigosa* Gould, and *P. alternata* Say, often still retain in the fossil state the red surface markings. Several similar cases other than those here referred to, might also be mentioned, but it is scarcely necessary in the present connection.

In its broadest sense, the term fossil is applicable to all naturally buried organic remains; whether recently entombed, or having been inclosed for countless ages in the earth's strata. In the general process of petrifaction of organic structures the animal matter is quickly destroyed and only the hard parts escape obliteration. When the proportion of organic to inorganic material is large there is usually a more or less complete effacement of all indications of life; but when the mineral constituents predominate, as in the shells of mollusks, brachiopods, and the tests of echinoderms, etc., these parts are often preserved intact, with simply a loss of animal matter. It frequently happens, however, that the calcareous shell is gradually and completely replaced by some other mineral substance, as iron or silicon, yet preserving perfectly the form and ornamentation. As might be expected under the circumstances the original coloration of fossil shells is very rarely retained; and the few instances noted are therefore of particular interest as revealing certain phases of molluscan life that existed in ages gone by. In the later geological deposits the retainment of some trace of coloration in shells is of course very much more probable than in the earlier rocks.

THE ISAAC LEA CHAPTER OF THE AGASSIZ ASSOCIATION.

BY DR. M. L. LEACH.

Referring to the organization of the American Association of Conchologists, notices of which have appeared in recent numbers of the NAUTILUS, it may not be out of place to mention that a similar society, having the same objects in view, is already in the third year of its existence. The Isaac Lea Chapter of the Agassiz Association, is made up of members widely scattered over the country, to whom the study of conchology is of special interest. There has never been a meeting of the Chapter, but the voting and all society business is done by correspondence. No fee is required for admission, and there are no assessments or dues. The members are

expected to correspond with each other, to exchange specimens, and to help each other in their scientific work. Once a year the members report to the secretary, and the secretary reports to the president of the Association, Prof. H. H. Ballard, Pittsfield, Mass. Prof Josiah Keep, Mills College, Cal., is president of the Chapter, and Dr. M. L. Leach, Wexford, Mich., is acting secretary.

STRENGTH OF LIMPETS.[1]

According to J. Lawrence Hamilton, M. R. C. S., the limpet is probably the strongest of known animals, excepting perhaps the *Venus verrucosa* of the Mediterranean Sea, which pulls 2,071 times its own weight when out of its shell. At Folkestone, Eng., Mr. Lawrence Hamilton found that the common sea shore limpet which weighs about half an ounce when deprived of its shell, required a force exceeding 62 lbs. to remove it from its powerful grip upon the rock, or 1,984 times its own dead weight. The superficial area of the base of the limpet experimented with measured 2.4 sq. inches. Mr. H. doubts whether the limpet's adhesive force has anything to do with the question of atmospheric pressure. A curious illustration of the limpet's strength is given by another naturalist. On a warm dry day in summer, on the Northern Coast of Scotland, a hare approached a limpet and endeavored to moisten its tongue by contact with the watery looking flesh of the latter; instantly, the limpet closed on to a rock pinning the hare fast by the tongue and holding it until the animal was caught by the observer of the occurrence.

COLLECTING CHITONS ON THE PACIFIC COAST.

Excerpts from a Diary.

BY MRS. M. BURTON WILLIAMSON.

Whilst peering under a rocky shelf (at Point Fermin) I saw something that seemed to move when I touched it accidentally with my knife. I pushed my knife under one end of it—the only end visible—

[1] We are indebted to Mr. S. R. Roberts for this interesting note on the adhesive power of the Limpet. It is from the *Illustrated American.*

and I found that the resistance was not that of a hard substance, but became less as my knife went farther under the rock and soon I had a big chiton, *Stenoradsia Magdalensis* Rve., on my knife! * * * Near where we found the *Conus* in the moss, in a shelving rock so close to another rock below it in the water that we could not remove it, we found a huge chiton. To get it out, it was necessary to break the sandy rock with a hatchet. There they lie, *Stenoradsia Magdalensis*, so close together that in less than three feet of the layer of rock that was chipped off we found over one dozen; some almost four inches in length! Just as they were collected from their damp environment they presented a beautiful appearance. On the outside, as well as inside, save three or four old fellows, the shells were a bright pink, like the interior of a pink-lined sea shell.

In a mossy carpet on a wet rock I found chitons, *Mopalia ciliata* and *M. lignosa* imbedded in the rock. Sometimes the Chitons were entirely covered with moss and could only be detected because the moss seemed to be growing in a circle. In the moss the Chitons, on the outside, were green and brown like the moss around them; under and between the rocks, they were pink; when found in little depressions in boulders out of the water, they were almost the exact color of the stone on which they lived. These were mostly the *Chaetopleura Hartwigii* Cpr. Here as elsewhere environment seems to play a most important part. Are specific differences merely the changing forms due to environment alone?

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

June 28, 1890.

The annual election for officers of the association took place by correspondence, as provided for in the rules, during the week commencing June 4th. The president, John H. Campbell and the secretary, Charles W. Johnson were unanimously re-elected. For vice-president several of the members were honored with the votes of their associates, but most of those voting, were of the opinion that it would be well to have the vice-president live in the same place as the other officers, particularly during the first year, so that Mr. John Ford of Philadelphia received more ballots than all the other persons voted for and was declared elected. Mr. Ford is one of the best-equipped conchologists in America. For many years he has

been an active member of the Academy of Natural Sciences of Philadelphia, and in identifying species he is almost unrivalled. While not the largest, his collection of shells is one of the finest in America, and in his specialty, the Olividæ, there is no other collection in America, which can approach it in the number and beauty of the specimens.

The Association is growing rapidly. There are now upon its rolls, representatives from Canada, Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, South Carolina, Florida, Texas, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Nebraska, Kansas and California. It is the intention to eventually enroll the conchologists of Central and South America, Mexico and the West Indies, as well as of the United States and Canada. From the tenor of the correspondence received by the officers, the idea of the Association meets with much favor.

Dr. V. Sterki of New Philadelphia, Ohio, requests the loan from members, of North and South American Pupidæ for study and comparison. He promises to return promptly and in good condition, the specimens which may be sent to him.

Frank C. Baker, of the Academy of Natural Sciences, Philadelphia, was a member of the Academy's recent expedition to Mexico He has returned, bringing with him numerous conchological acquisitions, as a partial result of the trip.

Rev. A. Dean of Muncy, Pa., has had the degree of D. D. conferred upon him.

The address of Prof. William H. Dall of the U. S. National Museum, Washington, upon "Deep Sea Mollusks and the conditions under which they exist" has been printed in pamphlet form. The address was delivered before the Biological Society of Washington, of which Professor Dall is the President. Another able paper of the professor's, "On dynamic influences in evolution" has also been printed in pamphlet form.

Geo. W. Harper, Principal of the Woodward High School, Cincinnati, Ohio, is the author of a "Catalogue of the Unionidæ of the Mississippi Valley."

Rev. W. M. Beauchamp, Baldwinsville, N. Y., is the author of "Land and Fresh Water Shells of Onondaga County, with a supplemental list of New York species."

Mr. L. B. Elliot, Iowa City, Iowa, is studying the dentition of mollusca and would be pleased to receive alcoholic specimens from the members.

The officers of the Association return thanks for the many kind messages conveyed to them in the letters of the members.

George T. Marston, Green Bay, Wis., has collected over 100 species from the vicinity of his place of residence. He makes a specialty of Wisconsin Mollusca.

A new circular is being prepared and will be sent, within a week, to all persons, who have been proposed for membership during the past month. Some care in the consideration of applications is necessary, as the officers have been written to several times concerning a class of collectors, who systematically commit frauds, by soliciting shells in exchange and not making any return. It is important that such persons should not be admitted to the Association.

T. Marshall Fry, Syracuse, N. Y., writes: "I think the Association may be made a success, if it is taken hold of with a will, and does not become too large and unwieldy."

Miss Ida M. Shepard, Long Beach, Cal., writes: "Last week we found a Cypraea spadicea alive, about eleven miles north of here. How much farther north they are found, I do not know, but think not very much." She has collected about 230 West Coast species of shells.

THE SHELL-BEARING MOLLUSCA OF RHODE ISLAND.

BY HORACE F. CARPENTER.

190.—*Margaritana arcuata*, Barnes.

Shell large, more or less kidney shaped, very inequilateral, thick and strong; beaks not prominent, much eroded; epidermis tar-colored; interior smooth, *bluish white with a greenish margin;* cardinal teeth, two in the left valve, erect, strong and pyramidal and one in the right valve, long, grooved and twisted. Length, 4½ inches; breadth, 1¼, inch; height, 2 inches. Some authors consider this species identical with the British shell called margaritifera and credit it with a circumboreal distribution quoting it from Europe, Siberia, British America and the Northern U. S. If this be so, it is the only species of fresh-water clam known to both continents. The European species is well known as the pearl-bearing Unio par

excellence, but I have never heard of pearls being found in our American shell; the interior of the British shell is described by Reeve as being *rose colored* or *salmon* with much iridescence and in another place as having a bluish-tinted interior; our shell has not these colors. The two species look very much alike, but there are differences to be observed in the appearance of the exterior as well as interior of the valves. The British species is found only in mountainous regions while ours is not so particular in its habitat. It occurs in running streams in Maine, New Hampshire, Vermont and Mass., and according to Gould is confined to the interior, and never found near the sea coast. The only specimens ever found in R. I.—some dozen or more—were obtained by a young lad of this city, Master Eugene Austin, in Roaring Brook, Exeter, while on a visit to his friends in that town in 1872.

(*To be continued.*)

PUBLICATIONS RECEIVED.

On Some Marine Invertebrata collected by Dr. S. M. Dawson in 1885, on the coast of British Columbia, by J. F. Whiteaves, (ex. Trans. Roy. Soc. Can. iv). Among the Gasteropoda and Pelecypods, *Leptochiton cancellatus, Bela violacea, Cancellaria circumcincta, Admete viridula Pecten alaskensis, Yoldia thracæformis* and *Sipho Verkruzeni* are northern forms, new to the Vancouver district; while *Solariella peramabilis, Barleeia subtenuis Limatula subauriculata* and *Leda acuta* are Californian shells, now for the first time reported so far northward. *Astarte undata* and *Eulima incurva*, if correctly identified, seem to be new to the fauna of the West Coast. *Margarita cidaris*, of which a fine series was collected, was previously known by a single specimen. *Cadulus aberrans* and *Leptochiton punctatus* are described as new. *Leptothyra sanguinea* L. is reported as collected at a number of localities, and its distribution given as "Japan, California and the Ægean Sea." We have already shown that the Mediterranean, Japanese and Californian shells belong to three perfectly distinct species; the true *L. sanguinea* being confined to the first named locality. To our Californian shell we gave the name *L. Carpenteri.* The list is an interesting addition to our knowledge of Vancouver mollusks.—*H. A. P.*

Description of a New Species of Land Shell from Cuba.—Vertigo Cubana. By W. H. Dall, Curator dept. of moll., U. S. Nat. Mus. 1890, p. 1. This is a remarkable form of Vertigo. It is a minute, oval shell. The surface strongly ribbed, aperture bearing lamellæ. The author compares it to the Sandwich Island *Pupa lyrata* of Gould.—*H. A. P.*

$1.00 per Year. ($1.12 to Foreign Countries.) 10cts. a copy.

12,214

THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR:
H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.
ASSOCIATE EDITOR:
C. W. JOHNSON, Acting Curator Wagner Institute of Science.

Vol. IV. AUGUST, 1890. No. 4.

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FIG. 1.

FIG. 2.

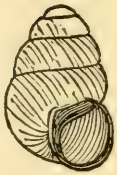

FIG. 3.

FIG. 7.

fig. A.

fig. B.

fig. C.

FIG. 4.

FIG. 5.

FIG. 6.

THE NAUTILUS.

VOL. IV. AUGUST, 1890. No. 4.

NEW UNITED STATES PUPIDÆ.

The plate opposite this page illustrates the species of Pupidæ described during the past year in the pages of THE NAUTILUS, by Dr. V. Sterki and others. The illustrations have been very kindly loaned by Mr. W. G. Binney.

Fig. 1. *Vertigo Binneyana* Sterki described in the Proceedings of the Academy of Natural Sciences of Philadelphia. See also THE NAUTILUS, March, 1889, p. 125.

Fig. 2. *Vertigo Dalliana* Sterki. See THE NAUTILUS for June, 1890, p. 19.

Fig. 3. *Vertigo rugulosa* Sterki. The Proceedings of the Philadelphia Academy, 1890, contain the description of this form.

Fig. 4. *Pupa Clementina* Sterki.

Fig. 5. *Pupa Oscariana* Sterki. Described in THE NAUTILUS.

Fig. 6. *Pupa Hemphilli* Sterki. THE NAUTILUS, July, 1890, p. 27.

Fig. 7. *Pupa syngenes* Pilsbry. THE NAUTILUS, May, 1890, p. 3.

The figures are from drawings by Dr. Sterki.—*H. A. P.*

NOTES ON SPHÆRIUM SECURE PRIME.

BY EDWARD W. ROPER.

The most common New England *Sphærium*, and the one most often incorrectly identified is *S. secure* Prime. It flourishes equally

well in ponds, rivers, brooklets and ditches, if only the water is clean. If the bottom is of mud, it will be found clinging to sticks, stone, dead leaves and submerged vegetation, climbing often nearly to the surface of the water. It is a small shell usually less than one-third of an inch long, and in color bright yellow, unless covered with vegetable mould. The animal is pink, and shows through the shell, so that the species may be recognized by its peculiar rosy glint in the water. The shell is trapezoidal, slightly oblique, acutely rounded in front, more elevated and truncate posteriorly. The beaks are approximate at the apex and project forward. The ends seem sharply pinched and there is a depression each side of the beaks, giving the impression of a ridge from the apex to each ventral end. This is the typical form and I have never seen it from south of New Jersey, nor west of New York.

Mr. H. F. Carpenter has described a Rhode Island shell as *Sphærium deformis*, which should be considered a variety of *S. secure*. It is somewhat larger, more elongated, and the basal margin compressed and distorted. From Adamsville, N. J., I have also many specimens of *Var. deformis*, smaller than the Rhode Island shells, but similarly twisted.

While the typical *S. secure* is an eastern shell, the more western states furnish some distinct varieties. From Traverse City, Mich., comes a very yellow, elevated form, the animal of which is also yellow. This is probably the shell described by James Lewis as *S. croceum*, and said to be found on gravel bottoms. This, however, may be a condition, rather than a habit, as the same thing occurs in the case of *S. secure* at Readville, Mass., in a clean pond.

From Fenton Co., Mich., I have a number of solid, globose, brown shells, which were identified at the Philadelphia Academy of Sciences as *S. sphaericum* Anth. They are thicker and more globular than any New England specimens of *S. secure*, excepting those from Readville, which are equally solid, with beaks more pointed, and in color yellow. Even more closely resembling the Readville shell is a form from Mercer Co., Ill., of an olive green color. These forms are liable to be confounded with *S. occidentale* Prime. The latter is of the same size, but is perfectly oval, and the rounded beaks hardly rise above the outline. *S. partumeium* is larger and more lenticular, and *S. truncatum* is thinner, pellucid and less tumid. A Kansas shell going the rounds as *S. sphaericum*, is another species, much larger, and allied to *S. contractum* and *S. elevatum*.

In conclusion, I would like to say a few words about collecting these puzzling shells. In common with others of the family, they arrive at maturity in the spring, and the adults are generally dead by midsummer. Those taken later in the season will be young and immature. It is more difficult to collect in the spring, when the water-courses are full to overflowing, but I have had little trouble since adopting a simple suggestion from my friend, George J. Streator, of Garrettsville, O. An ordinary wire dish-cover tied to a long pole is an effective scoop, and the meshes are fine enough to prevent the escape of small shells, while yet the mud can be washed out. Young shells will often be found within the adults, and should be saved, because in making exchanges, a set showing various stages of growth is the most useful for study and comparison.

NEW VARIETIES OF WESTERN LAND SHELLS.

BY HENRY HEMPHILL, SAN DIEGO, CAL.

Helix ptychophorus var. castaneus Hemphill.

Shell umbilicated, globosely depressed, of a dark chestnut color; surface covered with coarse, irregular, widely separated lines of growth, and crowded, microscopical revolving lines; whorls 5½, convex, the last slightly descending in front, spire elevated; suture well impressed, aperture subcircular; lip white, reflected and partially covering the umbilicus, its terminations approaching; umbilicus small and deep.

Height ⅝ inch, diameter 1 inch.

Habitat, Old Mission and Rathdrum, Idaho.

I regard *H. ptychophorus* as the progenitor of what I call the Towsendiana group of west coast land shells, and this colored variety seems to still further indicate its relationship to *Townsendiana*, for the spire whorls of nearly all the specimens of Townsendiana that I have collected are chestnut colored. Townsendiana does not begin to put on its wrinkles until it has made about four revolutions of the shell. The wrinkles are probably due to its environment.

Helix tudiculata var. subdolus, Hemphill.

Shell narrowly umbilicated; globosely depressed, of a dark yellowish color, surface somewhat shining, covered with oblique striæ,

interrupted by numerous wavy lines and oblong blister-like wrinkles, hardly perceptible to the naked eye; whorls 5½, convex, striped by a single chestnut band, double margined by lighter ones; spire very little elevated, suture well impressed; lip simple reflected, and nearly covering the umbilicus, its terminations approaching and joined by a thin callus; umbilicus narrow and small.

Height $\frac{5}{8}$ inch, greatest diam. 1 inch, lesser $\frac{7}{8}$ inch.

Habitat San Jasinto Valley, San Diego Co., Calif.

A very depressed form, quite variable in size, some of the specimens not being more than half the size of the measurements given. It is lighter colored than any of the southern varieties of *tudiculata*, except var. *Binneyi*.

Selenites Vancouverensis, var. Keepi, Hemphill.

Shell umbilicated, greatly depressed, thin, smooth, shining transparent, scarcely marked by the delicate wrinkles; very light horn color; whorls over four, somewhat flattened above and beneath, and scarcely descending at the aperture; spire flat, not rising above the body-whorl; suture well impressed; umbilicus moderately large, exhibiting most of the volutions; aperture transversely subcircular, wider than high; lip simple, thickened, sinuous above, very slightly reflected at the base, ends scarcely approached.

Width $\frac{5}{16}$ inch, height $\frac{2}{16}$ inch.

Habitat, Hills near Oakland, California.

One specimen only.

This rare and interesting little shell I collected some years ago. It is a perfect miniature form, in every respect, of *S. Vancouverensis*. I regard it as an extremely small variety of that so-called species. It is about the size of the variety of *S. Duranti* lately described as *S. cælata* Mazyck, but differs very materially in form, sculpture and the general texture of the shell. It differs from var. *Catalinensis* in being more robust, larger, and has a smaller umbilicus. I dedicate this pretty little shell to Prof. Josiah Keep of Mills College, California, who has done so much through his interesting little book to stimulate the study of West Coast shells.

Selenites Vancouverensis var. hybrida Hemphill.

Shell broadly umbilicated, depressed, slightly convex above, surface shining, polished, of a dark yellowish-green color, lines of growth coarse, rib-like and regular on the spire, finer and more irregular on the body-whorl, crossed by fine revolving lines that be-

come fainter on the last whorl, suture well impressed; aperture rounded, broader than high, greatly indented above; lip simple, very little reflected below at its junction with the columella, very sinuous above, its terminations joined by a very thin callus.

Height $\frac{3}{8}$ inch, breadth 1 inch.

Habitat, Astoria, Oregon.

In the strong rib-like sculpturing of the spire, depressed form and sinuous lip, it resembles *sportella*. In its greater diameter, dark greenish color, and the absence of the decussating sculpture on the last whorl it approaches *Vancouverensis*.

All our American *Selenites* commence life with a finely granulated shell. When they have attained about two whorls the striæ begins to appear and increase in strength as the shell increases in size.

It is well known that all shell-bearing mollusks construct their shells, in obedience to the laws of their constitutional characteristics and the environment, among which I include affinity of matter and mechanical skill, the later a faculty possessed to a greater or less degree by all animals. Some individuals in a colony of shells display greater mechanical skill than others, or possess stronger imitative powers, and closely follow the lines and styles of their forefathers, strictly attending to the details of sculpturing, not omitting a rib or line. Other individuals of the same colony, not having this imitative faculty so strongly developed, may change or vary the form of the shell by constructing it with more convex whorls generally resulting in a narrower or more elevated shell; or they may flatten the whorls, resulting in a broader and depressed form. Some modification of the umbilicus generally follows the change in the form of the shell. In both cases the sculpturing may be what we call characteristic of the species, or may be more or less modified, by the omission of one, two or more ribs, or the ribs may be more irregular in shape. A few lines may also be dropped, perhaps some added, or the entire surface may be modified in obedience to the laws of the mechanical skill possessed by the individual, and the affinity of matter secreted by the animal for the purpose of constructing the shell. An examination of a large number of *Selenites concava* and of our west coast forms, convinces one that the entire group of American *Selenites* is the offspring of a single common type.

A NEW PUPA.

BY DR. V. STERKI, NEW PHILADELPHIA, OHIO.

Pupa clementina, sp. nov. (Plate 1, figure 4.)

Shell very minute, narrowly perforate, cylindrical, pale horn colored, transparent, with rather obtuse apex; whorls 5½, regularly increasing, moderately rounded, with rather deep suture, smooth, with few microscopic striæ, somewhat shining; last whorl occupying rather more than two-fifths of altit., somewhat ascending to the aperture, with a slight, revolving impression on the middle of its last ⅓, ending at the auricle; a very slight, flat, crest-elevation near the margin, only in the lower part; aperture lateral, scarcely oblique, subovate with the palatal margin slightly flattened, upper part of same somewhat sinuous, peristome a little expanded with a slightly thickened lip just at the margin; lamellæ 6, white: two on the apertural wall, the apertural, typical, and a rather long supra-apertural, ending in a callus at the upper termination of the palatal margin; columellar one typical, horizontal; basal very small, nodule-like, deep seated; palatals two, typical, the inferior a little longer.

Alt. 1·9, diam. 0·8 mill.; apert.: alt. 6, diam. 0·5.

Three examples of this species were collected by Mr. H. Hemphill on San Clemente Island, California, among numerous *P. californica*, Row. All were exactly alike, well formed and fully mature. They cannot be referred to any one of our species published, and doubtless represent a form of their own, although so far it was not possible to examine the soft parts.

In size, shape and general appearance it somewhat resembles Isthmia, yet lacks the rib-like striation; the lamellæ would be typical for Vertigo and some of the smaller Pupa, but for the presence of the well-developed supra-apertural which *P. clementina* has in common with *P. calamitosa* Pilsbry and *hemphilli* Sterki; but on the other hand, there is nothing of the characteristic palatal, or gular folds of these two species. Thus, in several regards, our form is an intermediate and connecting one between different groups, and consequently deserves our special interest.

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

JULY 31, 1890.

Since last publication of list of members, the following new members have been enrolled in the Association:

No. 68. John L. Ogden, Philadelphia, Pa. *Naticidæ.*
69. Robert T. Jackson, Dorchester, Mass. *Pelecypoda.*
70. Shelly G. Crump, Pittsford, N. Y. *Turbinidæ* and *Trochidæ.*
71. George J. Streator, Garrettsville, Ohio. *Corbiculidæ.*
72. J. B. Quintard, Silver Lake, Kan. *Kansas Mollusca.*
73. Henry Prime, Huntington, N. Y. *Geographical Distribution of Land Shells.*
74. G. E. Manigault, M. D., Charleston, S. C.
75. Henry Moore, Columbus, Ohio. *General Conchology.*
76. J. B. Upson, Rockford, Ill.
77. H. K. Morrell, Gardiner, Me. *Unionidæ.*

Members desiring to propose applicants for membership should address the Secretary, Charles W. Johnson, Wagner Free Institute of Science, Philadelphia, Pa.

Dr. G. E. Manigault is connected with the Museum of Natural History, Charleston, S. C.

Prof. James H. Morrison, of the Virginia Military Institute, Lexington, Va., is taking an active interest in the Association and has already proposed a number of valuable members.

H. K. Morrell, of Gardiner, Me., writes: "I am simply a collector of shells and student of conchology." The Association is intended to associate collectors as well as students and scientists. By directing the attention of collectors to some special group or family, much valuable material can be put together. In fact, it is astonishing how rapidly specimens are added, when the attention is concentrated on a small group. It is impossible for anyone, unless he be a millionaire, to attempt to make a general collection of shells, which requires time, space and money; but, if each member would devote his time to making a fine special collection, and incidentally a representative generic collection, showing the different leading forms, much better results will be accomplished.

Rev. John Walton has changed his address from Lakeside, N. Y., to Pittsford, N. Y. Members will please take notice.

F. C. Browne, Framingham, Mass., writes: "I am afraid the members are not going to get the benefit they might, if they would correspond." It is one of the objects of the Association to induce correspondence between the members, especially between members interested in the same or analogous subjects. Comparison of views, exchanges of specimens, etc., will add to our stock of knowledge.

M. M. Shepman of Rhoon, near Rotterdam, Holland, writes: "I would like to have some information about the American Association of Conchologists. You will oblige me with a copy of the rules." The Secretary has supplied him with the information.

It may soon be possible for the Association to prepare a complete list of North American shells. Several of the members have selected the mollusca of special districts for study, and in time it is expected that the whole continent will be covered. As soon as that point is reached, each member might furnish a list of the mollusca of his district, with authentic localities and by consolidating the lists, an Association check list could be prepared. So far, the following districts are covered: Rhode Island, H. F. Carpenter; Wisconsin, Geo. T. Marston; Michigan, M. L. Leach, M. D.; Kansas, J. B. Quintard; West Coast, Prof. Josiah Keep, Miss Ida M. Shepard, W. J. Raymond and G. W. Lichtenthaler; North West Atlantic, Sanderson Smith; Vancouver Province, Geo. W. Taylor.; Besides these the Land and Fresh Water shells of North America are being studied by H. A. Pilsbry, F. R. Latchford, Geo. W. Harper, Bryant Walker, J. A. Singley, Rev. W. M. Beauchamp, Wm. G. Mazyck, D. V. Sterki, W. W. Westgate, U. S. Grant, W. G. Binney, and W. S. Strode, M. D.

THE SHELL-BEARING MOLLUSCA OF RHODE ISLAND.

BY HORACE F. CARPENTER.

FAMILY UNIONIDÆ.

191.—*Margaritana marginata*, Say.

Syns.:

Alasmodonta marginata, Say, Barnes, Con. Stimp. Adams.
Unio varicosa, Lam.

Mya rugulosa, Wood.

Alasmodon marginata, DeKay, Gould.

Margaritana marginata, Lea.

Shell ovate, thin, wedge-shaped, gaping widely behind; beaks small, elevated; surface wrinkled posteriorly; epidermis olivaceous, radiated with dark green; teeth, one in each valve, small, compressed, directed forwards; nacre bluish-white with a chalky margin. Length, 2 inches; height, $1\frac{1}{10}$ inch; breadth, $\frac{9}{10}$ inch.

This species is not all common in New England, and is found very sparingly in the Blackstone River, just above the Tin Bridge in Central Falls.

192.—*Margaritana undulata*, Say.

Syns.:

Unio undulatus, Say.

Alasmodonta undulata, Barnes, Adams.

Mya undulata, Wood.

Unio lirans, Valenc.

Strophitus sculptilis, Stimp.

Shell short, tumid, angular behind and widely gaping; breaks prominent, with three or four undulations upon them; epidermis shining, of a dark olive color, rayed with alternating yellowish and dark bands; nacre on the anterior half, thickened, opaque, white; on the posterior half, thin, translucent and of a silvery luster, showing through it the exterior radiations; hinge supported on a very strong rib; the left tooth erect, conical and striated above; the left tooth erect, and produced backwards under the ligament. Length, 2 inches; height, $1\frac{3}{5}$ inch; breadth, 1 inch. It is more common than marginata, and is found in the Blackstone River and in most of our larger ponds.

(*To be continued.*)

GENERAL NOTES.

Species determined. From W. J. Raymond, Oakland, Cal. 1, *Olivella floralia* Duclos, West Indies; 2, *O. nivea* Gmelin, West Indies; 4, *Patella confusa* Gmel., West Indies.—*C. W. J.*

Limnæa columella *Say*. Not found in recent years near Philadelphia, is quite abundant in ponds along the line of the Pennsylvania Railroad near Bonnaffon, Philadelphia.—*Ed.*

Natica wanted. The undersigned wishes to buy, or obtain in exchange, specimens of the genus *Natica*. John L. Ogden, 72nd st. and Greenway ave., Philadelphia.

HELIX HORTENSIS *Mull.* The uniform lemon-yellow form has been found by Dr. Benjamin Sharp in the town of Nantucket, Nantucket Island.—*Ed.*

PUBLICATIONS RECEIVED.

A NEW SPECIES OF FRESH-WATER MOLLUSK, by B. Shimek (Ex. Bull. Lab. Nat. Hist. State Univ. of Iowa, vol. 1, p. 214). A species of *Ancylus* with very strongly recurved apex is described and figured by Prof. Shimek in this paper as *A. obliquus*.[1] The right side of the shell is slightly incurved or straight. The largest specimen measured 3½ mm. in length, 1.8 in width, 1.5 mm. high. It occurs not uncommonly about 5 miles east of Lincoln, Nebraska, in Dead Man's Run, a streamlet with numerous pond-like enlargements. Specimens were found by Mr. Shimek at all seasons of the year, adhering to the shells of *Anodonta plana*, sticks, leaves, etc.

This same form, or a very similar one, has been found, by the writer, back of Rock Island, Illinois, in a certain swamp well known to those bare-footed urchins who offer pond-lilies at "only five cents er bunch, Mister" on the streets of the "Three Cities."[2]

Certain indications led me at the time of finding this shell to refer it to *Gundlachia* instead of *Ancylus;* and it may be worth while to follow this clew further. If my supposition proves to be correct, *Gundlachia* will furnish the most extraordinary case of dimorphism known among our American mollusks.—*H. A. Pilsbry.*

CATALOGUE OF NORTH AMERICAN SHELLS collected by Henry Hemphill. This pamphlet catalogues 1763 species and varieties of land and marine shells collected by the author, including a majority of the species found on the Californian and Floridan coasts.

LIST OF THE MOLLUSKS OF OTTAWA, as recorded in the *Transactions of the Ottawa Field-Naturalists Club* up to April 1st, 1890, is given in the *Ottawa Naturalist*, April, 1890. It comprises 127 species, giving that part of Canada quite a varied fauna, richest in *Cyrenidæ* (14 species), *Unionidæ* (27 species), and *Limnæidæ*. From F. R. Latchford.—*H. A. P.*

LES MOLLUSQUES DE LA PROVINCE DE QUEBEC, by M. L'abbé Provancher (in *Le Naturaliste Canadien*, March, 1890). Includes the marine, land and fresh-water forms.

[1] This name is three times preoccupied in *Ancylus*. If the species proves really distinct from *Gundlachia Meekiana* it might be called *Ancylus Shimekii*.

[2] Davenport, Rock Island and Moline are locally known by this name.

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Hugh Fulton, 89 Fulham Road, London, S. W.

THE NAUTILUS.

VOL. IV. SEPTEMBER, 1890. No. 5.

REMARKS ON CERTAIN GONIOBASES.

BY H. A. PILSBRY.

The typical *Goniobasis pleuristriatus* of Say is a shell of the general form of *Gon. virginica*; and like the variety *multilineata* of that shell, it is encircled by numerous fine raised striæ. It has been collected in a number of the small rivers in Texas north of the Rio Grande, the northermost being that beautiful stream, the Guadaloup River, in Comal County. Thomas Say described the shell in the *New Harmony Disseminator* in 1829,—Say at that time being still connected with that luckless company of socialists at New Harmony, Indiana.

In the Comal Creek, at the German colony of New Braunfels, the the writer found very numerous specimens of a variety which wholly lacks spiral striæ, and has low, subobsolete longitudinal folds. There is a single carina on the whorls of the spire. Specimens of this variety were distributed by me several years ago under the name of "*Goniobasis comalensis*;" which name I now propose to use for this variety. In the absence of a figure, I will be glad to send specimens to any student of the Melanians who will apply to me. My friend, Mr. J. A. Singley, has also collected specimens at New Braunfels. This melanian is notable for the fact that its range is wholly sundered from the rest of the family by the numerous rivers of central and eastern Texas, draining into the Gulf, and without a single species of the family Strepomatidæ. The great extension of the Gulf during past ages, up the Mississippi valley, shows the Texan

region to have been still more separated formerly from Tennessee, the present headquarters of the American Melanians.

In this connection I might mention a matter to which Professor Theodore Gill of Washington directed my attention during a recent conversation; namely, whether the Californian Melanians do not belong to the old-world family *Melaniidæ* instead of to the American group *Strepomatidæ* (= *Ceriphasiidæ* Gill, *Pleuroceridæ* Fisher). I have found that certain features of the dentition of *G. plicifera*—the *trilobate* base of the rhachidian tooth—are more similar to the *Melaniidæ* than to the East American forms. I would, therefore, ask some western naturalist to observe whether the edge of the mantle be fringed or plain; or, if any one has alcoholic or even freshly dried specimens, and will communicate a few to me, I will announce the result of an examination through the pages of the NAUTILUS.

A FEW "NEVERS" FOR CONCHOLOGISTS.

BY DR. V. STERKI.

One or another of the following hints may be of service to younger students of Conchology, and also the older ones possibly will read them:—

Never dry your specimens in too great heat; they should be dried, but not fried. Not only the shell is liable to change color and to become utterly fragile, but also the "soft parts" are so changed as to be unfit for microscopic examination.

Never kill and dry them when the animals are still active: in this way the aperture may be filled up in a way that it is very difficult or even impossible to examine it; this is especially of importance in Pupidæ and other groups with lamellæ etc., in the aperture. When the specimens are kept dry in a box for a few days, they will retire deep enough in the shell to leave the aperture free.

Never pack up specimens without adding a label with the habitat and as much notice about its nature as possible. Without that, they may be worthless or even worse!—When Shuttleworth, that eminent English Conchologist, had died at Berne, Switzerland, the contents of several boxes of his valuable collections had to be destroyed (not thrown away!), because there were no labels with them, and the catalogues not to be found.

Never forward a lot of shells for examination, or in exchange, unless there be at least one mature specimen in good condition among them—if you have any such, of course. This is again especially of importance *e. g.* with Pupidæ where the lamellæ are of principal interest.

Never pack up small shells in a vial to be sent away unless you secure them in place with some cotton; the constant tossing and jarring cannot but damage them more or less.

Never pack a number of vials together in a box unless each one is wrapped in paper. In several instances I have received vials crushed to pieces and the contents scattered around.

Never oil your shells so that they soil or stick to anything they touch! not to speak of their entirely altered appearance. Very little oiling generally is needed—(by this I certainly do not mean Pupa, Vertigo, etc.!)

Never cork a vial containing living mollusca or such not thoroughly dried; not only a very offensive odor will develop, but generally the shells will be altered in appearance, color and consistency.

A NEW VARIETY OF HELIX CARPENTERI FROM SOUTHERN CALIFORNIA.

BY DR. LORENZO G. YATES, F. L. S., SANTA BARBARA, CAL.

The typical form of Helix (Arionta) Carpenteri, Newc. seems to belong to the peninsula of Lower California, although heretofore reported from "San Diego" and "Tulare Valley" California, and I have specimens of a variety which I collected in Napa County many years ago.

I now have a variety from the desert region near Indio, San Bernardino County, California, collected by Stephen Bowers, Ph. D.

These specimens agree with Dr. Newcomb's original description except in that, they do *not* show the "very minute spiral striations," which may however be consequent upon their dead and bleached condition.

They further differ in having an *entire* circular aperture instead of "aperture circular, with terminations approximating" as described by Newcomb.

Helix Carpenteri is a species which from its native peculiarities is is well adapted to inhabit the desert regions, and continue to exist where the majority of our helicoid shells would be unable to retain a foothold.

Dr. Bowers writes me that he "found these shells on the south side of the valley among granite talus, and nowhere else, and these in a fossil state," but judging from the appearance of some of the specimens it is probable that living shells may still be found in the vicinity; but whether this variety represents the ancestral form of the more recent type, or is a local deviation arising from pecularities of environment cannot be satisfactorily determined without further investigation of the locality.

While writing the above I found some other species of semi-fossil mollusca, which were collected in the same locality some time ago, by an enthusiastic young naturalist, whom I have since learned, lost his life in the desert regions of Lower California, thus adding one more martyr to the cause of science. He sent these shells to me for determination, and not having heard from him since, I will give the determination of their species in a future number of the NAUTILUS.

PRELIMINARY NOTICES OF NEW AMNICOLIDÆ.

BY H. A. PILSBRY.

Cochliopa Tryoniana Pilsbry.

A more depressed shell than *C. Rowelli* (the only other described species), broader, *with the base rounded, not carinated around the umbilicus.* Whorls 3½, convex, rather obsoletely spirally striated; color greenish-gray. Umbilicus minute. Aperture very oblique.

Alt. 3½, diam. 4 mill.; oblique alt. of aperture 2⅔, width 2 mill.

Habitat, Polvon, Nicaragua.

Amnicola Sheldoni Pilsbry.

Shell rather elongated, solid, thick, light gray; subimperforate. Whorls four to five, slightly convex, somewhat flattened above, lightly striate transversely; slightly impressed below the shallow sutures. Apex obtuse. Aperture small, ovate, slightly narrowed

and angled above, rounded below, flattened on parietal margin. Peristome continuous, not sinuous.

Alt. 3 to 3·5 mm., diam. 2 to 2·25 mm.

Habitat, Lake Michigan, at Racine, Wis., in 30 fathoms.

The shallow sutures and heavy texture are the more prominent characters of this shell. In these points a resemblance to *Hydrobia ulvæ* and other species of that group may be traced. From *Amnicola lustrica* the more flattened whorls at once separate this form.

We are indebted to Dr. P. R. Hoy of Racine, Wis. for numerous specimens. The species is named in honor of the late Professor D. S. Sheldon of Davenport, Iowa,—one of the pioneer naturalists of the Mississippi Valley.

Amnicola lustrica Pilsbry.

Shell slender, elevated, thin, translucent, wax-colored or slightly brownish; whorls five, well rounded; sutures deep; aperture ovate, narrowed and slightly angled above; peristome entire, adherent to body for a short distance above the narrow umbilicus.

Alt. 4, diam. 2 to 2½ mill.

Habitat, New York to Illinois and Minnesota.

A species of the Lake drainage.

Say's *Paludina lustrica* has been referred by Haldeman and Tryon to *Pomatiopsis lapidaria*. Binney also places it in *Pomatiopsis*, and the original of his fig. 189[1] is certainly an immature *P. lapidaria*, as I know by an examination Say's of original type. The name *lustrica* has, however, been applied by some collectors to the present species: and while we must write *lustrica Say* a synonym of *P. lapidaria*, the name may also stand in *Amnicola* for the well known form described above.

The species is variable in form as the figures[2] show. *It is narrower than any other Amnicola*, but wider than *Bythinella Nicklini-ana*. In size and color, *Bythinella obtusa* is similar; but the acute apex of *lustrica* will separate it from that blunt little species.

The animal and dentition are similar to *A. limosa*.

[1] Land and Fresh Water Shells, N. A. pt. II,

[2] It is figured in a work now in preparation on the Mollusks of the Northern U. S.

CYPRÆA SPADICEA.

BY LORENZO G. YATES.

In the July, No. of THE NAUTILUS, Miss Ida M. Shepard of Long Beach, Cal., noted the finding of *Cypræa (Luponia) spadicea* eleven miles north of that place, and questions "How much farther north they are found?"

This somewhat rare and very handsome shell is found in the Santa Barbara Channel. I found three live shells in one day recently, and a friend found as many as seventy-five fine living specimens in one day, some fifteen or eighteen miles distant from Santa Barbara, northwest, and what was of more interest to me, he generously divided his find.

In preparing a List of the Mollusca of Santa Barbara County for publication, I was surprised at the large number of species, whose northern, or southern limit is the Santa Barbara Channel, besides a number of species which have not been noted from any other locality on the west coast, some of them being restricted to the channel and its islands.

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

AUGUST 26, 1890.

Since last announcement the following new members have been enrolled in the Association:

No. 78. Chas. E. Beecher, Ph. D., New Haven, Conn. *Palaeozoic Mollusca.*

79. Jerome Trombley, Petersburg, Mich. *American Land Shells.*

80. W. G. Binney, Burlington, N. J. *American Land Shells.*

81. W. Newcomb, Ithaca, N. Y. *General Conchology.*

82. F. A. Sampson, Sedalia, Mo.

83. C. Antoinette Shepard, New Britain, Conn. *The Uses of Shells.*

84. Laura J. F. Hecox, Santa Cruz, Cal.

85. J. R. Mead, Wichita, Kan. *Unionidæ.*

86. Arthur F. Gray, Yonkers, N. Y.

87. S. M. Luther, Garretsville, O. *Helicidæ.*

88. Dr. Stephen Bowers, Ventura, Cal.
89. E. H. Harn, Blairsville, Pa. *Geographical Distribution and Specific variation in Land Shells.*
90. Prof. Leslie A. Lee, Brunswick, Me. *Arctic Moll. and Post-pliocene Fossils of No. Latitudes.*
91. O. A. Crandall, Sedalia, Mo. *Physa.*
92. Philip E. Marsh, Aledo, Ill. *No. American Helicidæ.*
93. Prof. Edw. W. Claypole, Akron, O. *Palaeozoic Mollusca.*
94. E. Leslie, Hamilton, Ont.
95. Mrs. S. H. Young, Long Beach, Cal.
96. L'Abbé Provancher, Cap Rouge, Quebec. *Mollusca of Province of Quebec.*
97. A. Schlehenreid, New York, N. Y.

In the course of the next ten days, a complete printed list of all the members of the Association, together with their exact addresses, memorandum of subjects chosen for special study etc. will be issued, and a copy sent to each member for his own use.

We are please to note the enrollment of two such distinguished Conchological veterans as Dr. Newcomb and Wm. G. Binney. Mr. Binney writes that "it will be a pleasure to me to assist all who are studying mollusks, but I fear indifferent health will prevent my being of much use to them." Dr. Newcomb writes in the same kind spirit, desiring to aid younger students in their work.

Dr. Newcomb is now 82 years of age—probably the oldest living American Conchologist. He has been a great worker, having collected upon 23 of the West India Islands, in the interior of British Guiana, in Equador and Colombia, Nicaragua, Costa Rica, Honduras, and West Mexico to Panama, in California and on 6 of the Sandwich Island group. His publications are numerous, many papers by him having appeared in the Conchological journals of Europe and America. As he himself writes "I am almost alone; my old friends Agassiz, Gould, the elder Binney, Anthony, Lea, Reeve, Cuming, Swift, Bland, Wheatley and many others have passed away."

O. A. Crandall, Sedalia, Mo. is studying the genus *Physa* and writes as follows. "If the members of the Association will send me specimens of *Physa* from all over the country, I will take it as a favor, besides returning them value in other exchanges."

H. K. Morrell, Gardiner, Me., writes: "By the way I notice that in the last NAUTILUS, Mr. Carpenter speaks doubtfully of pearls

being found in *Margaritana arcuata*. I have a friend who has done quite a business in collecting them from that mussel."

E. H. Harn, Blairsville, Pa. in five years, has found 64 species and varieties of shells in his neighborhood. That is a sample of what can be done by patient search.

Mrs. M. Burton, Williamson University, Cal. sends us a copy of the Weekly Tribune of Los Angeles, Cal. of August 16th, containing an interesting article by Virginia Burton, upon the "Coffee-bean Cowries" of the California Coast (Trivia Solandri and Trivia Californica.)

Mr. Frank C. Baker, who has been studying at the Academy of Natural Sciences of Philadelphia for a year past, and who was one of the members of the expedition sent by the Academy to Southern Mexico, has accepted a position with Prof. Henry Ward of Rochester, New York, in his department of Invertebrates. Mr. Baker leaves many warm friends in Philadelphia, where he will be missed from the circle of conchologists as well for his kindly personal qualities as for his recognized ability in the study of Mollusks.

THE SHELL-BEARING MOLLUSCA OF RHODE ISLAND.

BY HORACE F. CARPENTER.

FAMILY UNIONIDÆ.

Genus *Anodonta*, Cuvier.

Shell transversely elongated, inequilateral, thin, toothless.

To distinguish instantly between the three genera, Unio, Margaritana and Anodonta, it is only necessary to examine the hinge. Unio has cardinal and lateral teeth in each valve; Margaritana has cardinal teeth, but no laterals, while Anodonta has no teeth, the valves being held together only by the ligament.

There are two hundred species of Anodonta, distributed world wide. Two of these are known to inhabit R. I., and a third may possibly be found within its limits.

193.—*Anodonta cataracta*, Say.

Syns.:

Anodonta fluviatilis, Lea, Gould, Stimp.

Mytillus illictus, Solander.

Shell thin, inflated, transversely sub-oval, fragile; basal margin curved; hinge margin straight; epidermis smooth, excepting at the

posterior and upper portion, where it is loosely wrinkled; color deep grass green, dusky above and behind, radiated; nacre silvery or bluish-white, margin greenish. Length given by authors, 4½ inches; height, 2¾ inches; breadth, 1½ inch.

When shells are figured in books the specimens selected for the purpose are always the largest and finest ones to be had. When Say described this species in 1816, he gave its length as 2⅝ inches. Gould gives it 4½ inches, but I have frequently seen specimens over five inches in length and have *one* myself six inches long. Gould considers the species very rare, found only in ponds in the central and western parts of Mass., but Perkins finds it near New Haven, in Conn., and we have at least two localities in R. I., and one in Attleboro, near the line.

194.—*Anodonta implicata*, Say.

Shell transversely oblong, almost as broad as high, very variable in proportions, thick and strong in some, thin and fragile in others; epidermis yellowish olive (darker above and behind), with dark brown zones; young shells grass green, resembling *A. cataracta*, middle aged resembling *U. radiata*; nacre silvery white until after the middle age, when it becomes flesh colored or salmon. Length about four inches, height, 2¼ inches; breadth 2 inches. Gould says it inhabits ponds in Essex and Middlesex counties in Mass., and has been found in Maine. Whether it occurs southward or not is uncertain. We find them in R. I., extremely common in all our ponds and rivers.

195.—*Anodonta undulata*, Say.

Shell transversely oval, thick; beaks prominent, the points in contact, and when not eroded they exhibit four or five undulations upon them; epidermis dark brown, radiated; hinge with a vestige of a tooth, this peculiarity forming a connecting link between Anodonta and Margaritana; nacre salmon colored, granulated in the centre, bluish-white outside the pallial impression, with a broad margin of olive. Length, 3½ inches; height, 2 inches; breadth, 1½ inch.

The locality given by Gould is the Blackstone River and its tributaries in Mass., and as this river flows through several miles of R. I. territory, I include it here although no specimens have been obtained within our limits.

FAMILY NUCULIDAE.

The Nuculidæ or Nut shells are small, pearly, angular shells. They commenced in the Lower Silurian and are abundant in all the various formations since. Most of genera belonging to this family are known only as fossils. Three of the living genera, Nucula, Leda and Yoldia inhabit New Eng. and two are represented in R. I.

Genus *Nucula*, Lamarck, 1799.

There are about fifty species, inhabiting all parts of the world, most of which are found in deep water. Five species are in New Eng. two of which probably inhabit R. I.

196.—*Nucula delphinodonta*, Mighels.

Syn.:

Nucula corticata, Holboll., Möller.

Shell small, obliquely triangular, very broad; beaks nearly at the posterior end, elevated and tumid; hinge with three posterior and seven anterior sharp elongated teeth; surface with coarse lines of growth; epidermis olivaceous. Length $\frac{13}{100}$, height $\frac{11}{100}$, breadth $\frac{8}{100}$ of an inch.

This species was found in large numbers in the stomachs of Cod-fish, taken in Casco Bay, and described by Dr. Mighels in Journ. Bost. Soc. Nat. Hist. iv, 1842. It inhabits soft mud from ten to one hundred fathoms water from Cape Cod to Greenland, and is included among the shells of R. I. only on the authority of Stimpson, who says it inhabits the whole coast, laminarian region, and of Prof. Verrill who found it in twenty-nine fathoms, east of Block Island and off Gay Head.

197.—*Nucula proxima*, Say.

Shell small, thick and solid, very oblique, ovate-triangular; beaks elevated, inclined forwards; surface crossed by minute lines, both radiating and concentric; epidermis light olive with darker zones; interior lined with pearly nacre; margins finely crenulated; hinge with twelve teeth before the beaks and eighteen behind them. Length $\frac{9}{20}$, height $\frac{7}{20}$, breadth $\frac{1}{4}$ inch.

Described by Thos. Say in Journ. Ac. Nat. Sc. Phila. 11, 270, 1822. It is frequently taken from the stomachs of fishes. Its habitat is soft mud below low water, but it has been collected on the shore at Martha's Vinyard. Distribution, from South Carolina to Gulf of St. Lawrence. It is very abundant in our bay, in mud, off Rumstick, near the mouth of Warren River, where every throw of the dredge will bring up hundreds of specimens.

Genus *Leda*, Schum., 1817.

This genus contains eighty species, four of which inhabit New England and farther north. I am not aware that any species of the genus inhabits R. I. although Prof. Verrill says in speaking of Leda tenuisulcata, Stimpson, it inhabits from R. I. to Gulf of St. Lawrence.

Genus *Yoldia*, Möller, 1832.

Five species of these peculiar shaped and highly polished shells inhabit New Eng. *one* of which is found not living, but in a semi-fossilized condition in Maine.

(*To be continued.*)

GENERAL NOTES.

HALIOTIS RUFESCENS, *Swains.* In the last number of the *Manual of Conchology* Mr. Pilsbry gives the range of *Haliotis rufescens*, Swainson, "From Mendocino Co. to San Nicholas Island California." In 1874 or 1875 I collected several very fine living specimens, at extreme low tide on rocks near the mouth of San Tomas River, Lower California. This extends it range fully two hundred miles south of San Nicholas Island. I may also add, that *Haliotis cracherodii*, Leach, ranges two or three hundred miles south of San Tomas River.—*Henry Hemphill, San Diego, Cal.*

HELIX HÆMASTOMA VAR. CONCOLOR. Among the hundreds of specimens of the *hæmastoma* which I have seen, I never found one

without white zones or bands, until a short time ago some were sent me of a rich chestnut color all over. The lip is pink, as usual. This color-pattern is so conspicuous that it may deserve a varietal name.—*H. A. P.*

Constructed or secreted? In the August number of the Nautilus Mr. Henry Hemphill makes the following statement: "It is well known that all shell-bearing Mollusks construct their shells, in obedience to the laws of their constitutional characteristics and the environment, among which I include affinity of matter and mechanical skill, the latter a faculty possessed to a greater or less degree by all animals."

In my simplicity I had supposed that shells were secreted, as bone is secreted, not constructed. By whom is it "well known" that they are constructed, and how do they know it?

I ask these questions not in a spirit of criticism, but to a draw out facts. Mr. Hemphill will help to make the Nautilus interesting, if he will give us in its pages a succinct statement of the leading facts on which his theory is based.—*M. L. Leach.*

Offered Land and fresh water shells of this locality for shells of other localities. G. M. Leslie, 69 Main St., W. Hamilton, Ont., Canada.

Bulimulus in Texas. While in the field on the State Geological Survey last week I saw the white *Bulimulus* with yellowish wash (*Bulimulus* var. *Mooreanus*) sticking to dry dead woods in a blazing sun with temperature up to 95° in the shade. This was the only colony seen in ten days riding. Vegetation is very much parched in the region from 90 days drought.—*G. H. Ragsdale Gainesville, Texas, August,* 1890.

Species determined. From L'abbe Provancher, Cap-Rouge, Quebec, Can.—Nos. 1, 2, 3, 4, *Bulimulus exilis* Gmel. Barbadoes, Dominica, St. Lucia. 5 *B. vincentinus* Pfr. Trinidad. 6 *B. elongatus* Bolt. Trinidad. 7 *Goniobasis livescens* Menke, Kankakee R. Ill. 8 *Paludina integra* Say, Fox R. Ill. 9 *Pleurocera subulare* Lea, Fox R. 10 *Paludina lineata* Val. Fox R. 11 *Cardium ciliare* Gmel. Europe. 12 *Cytherea convexa* Say, Magdalen Islands Gulf of St. Lawrence.—*C. W. J.*

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A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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THE NAUTILUS.

VOL. IV. OCTOBER, 1890. No. 6.

CRITICAL NOTES ON THE BULIMULI OF FLORIDA.

BY BERLIN H. WRIGHT, LAKE HELEN, FLA.

Bulimulus Dormani W. G. B. **var albida** Wright.

That this is a good variety would appear from the following facts: It is *never found associated with the typical.* I have seen trees literally loaded with the typical *B. Dormani*, where it would have been possible to have secured thousands of specimens in a few hours time and have taken as many as five hundred in a day, but never have been able to discover any tendency to change of any of the characters. At one time I had over *one thousand* living, full grown specimens spread out in a large box and with the closest scrutiny no freaks were seen. We liberated nearly all of them subsequently.

In a dense hammock well isolated from any similar lands and fully a dozen miles from any locality where the typical *B. Dormani* is to be found, the *pure white* shell occurs. It is not plentiful, but always *spotless.* In form it does not seem to differ from the typical.

Bulimulus Hemphilli Wright.

In the hammock lands located upon the narrow strip of land lying between Mosquito Lagoon and the Atlantic Ocean, there is another form of Bulimulus found. This is shorter, its whorls more rounded and is thinner than *B. Dormani.* This shell was discovered by Mr. Henry Hemphill of San Diego, Cal. in 1884 and Dr. Binney, judging from the few *dead* specimens in hand, pronounced it a var. of *B. Floridanus* Pfr. Subsequently I found a fair number of living specimens and became convinced that it was a good species and

described it under the name of *Bulimulus Hemphilli* in the West American Scientist of April, 1889.

During the present season I have had the opportunity to compare the animals, eggs and habits with typical *B. Dormani* and no doubt is left as to its being distinct from it. But as to its relation to *B. Floridanus* I am not able to say so positively, never having seen this *unknown* shell. However I claim the following differences appear from comparison with the published figure and description. See Binney's American Land Shells, p. 407–8, fig. 448.

B. Floridanus Pfr.	B. Hemphilli Wright.
1. Perforate.	1. Imperforate.
2. Narrow.	2. Wide.
3. Grayish green.	3. Amber dull lead color.
4. Variegated-white-streaks and spots.	4. Obscure brownish red bands below.
5. Spire acute, elongate.	5. Spire blunt, short.
6. Aperture $\frac{3}{7}$ length of shell.	6. Aperture $\frac{2}{3}$ length of shell.
	7. Base uniformly and gracefully rounded.
7. Subangulated below.	
8. Attenuated at base.	8. Expanded at base.
9. Whorls $6\frac{1}{2}$.	9. Whorls 5.
10. Rather smooth.	10. Marked by coarse lines of growth.

I call this quite a "general difference." and from which I believed myself justifiable in giving to it a name, especially after receiving the following letter from Dr. Binney:

August 16. 1888. "I find the jaw and lingual dentition to be same as in *B. nitelinus* Rv.—*B. serperastrus* Say." August 26, 1888. "I am aware that said figure (449) does not agree with the carinated body whorl of *B. Floridanus*, but in the present state of our ignorance of the range of variation of these Bulimi, who knows?"

"It would be well for you to describe your shell as new, leaving to the future the decision of its identity with *some other* W. I. or *Spanish Main species.* To us Americans, it is *surely new.*"

I am thus specific about this because Dr. Binney has subsequently (see last Ed. of Manual of American Land Shells) placed *B. Hemphilli* Wright, as a synonym of *B. Floridanus.* Why he should do so, after the above declaration, is strange to me, unless he is naturally too conservative.

Who has seen it—Bulimulus Floridanus Pfr.?

After seven years spent in Florida, travelling about much and always keeping a sharp look-out for shells and plants, I have never

yet found anything bearing any resemblance to this shell. True, it may exist upon some of the Keys, but diligent inquiry among correspondents fails to bring out any information as to its whereabouts. Does any reader of THE NAUTILUS know of any specimen having been found? Has any one ever seen it? Is there a specimen in the United States? If no one has any knowledge of the shell's existence in Florida, is it not time the name was dropped and treated as a lost species? Many sharp collectors and students have scoured the wilds of Florida very thoroughly and if it is really here its presence should have been known before this.

Any one posessing any information upon this matter will confer a great favor by addressing the writer.

A NEW VARIETY OF HELIX.

BY LORENZO G. YATES.[1]

Helix (Arionta) Carpenteri, Newc.

Variety INDIOENSIS, L. G. Yates.

Shell umbilicated, rounded conical, apex obtuse, obscurely marked with one brown band, lines of growth well defined; whorls 5, rounded; suture well marked; aperture circular, entire; peristome slightly expanded, except at the columella, where it is broadly expanded in a line nearly parallel with the vertical axis.

Greater diameter 18 mm. height 12 mm.

Habitat, near Indio, San Bernardino County, California, Collector, Stephen Bowers.

NOTICES OF NEW AMNICOLIDÆ.

BY H. A. PILSBRY.

Bythinella Hemphilli Pilsbry.

Shell minute, very slender, about the shape of *Carychium exiguum* Say. Apex obtuse, whorls 5, convex, the last imperforate. Aperture

[1] By a curious oversight the following was omitted from Dr. Yates' paper in the September *Nautilus*.

ovate, about one-third the length of the entire shell; peristome continuous, its plane oblique to the axis of the shell, the base of the lip being advanced. Color, corneous, often encrusted with a black ferrugineous deposit. Alt. 2·4, diam. 1 mm.

The types were collected by Henry Hemphill near Kentucky Ferry, Snake River, Washington. The species is more nearly allied to *B. Aldrichi* Call, then to our other forms, but is far more slender than any *Bythinella* yet made known to us from North America. The plane of the peristome slants forward toward the base, as in the species of *Pleurocera*, but the lip is not sinuous. This peculiarity alone will separate *B. Hemphilli* from all other species.

Bythinella brevissima Pilsbry.

Shell narrowly umbilicated, pupiform, composed of 4 or 4¼ very convex, rounded whorls, the first two increasing rapidly in width, the last two more equal in width. Aperture a little over one-third the length of shell; oval; the columellar side a little more flattened than the outer; peristome simple, continuous, in contact with the body-whorl at the upper part, but not modified or flattened by that contact. Umbilicus rather large. Surface slightly wrinkled longitudinally. Alt. 2·8, diam. 1·8 mill.

This species was collected by John H. Campbell, Esq, in Haulover Canal, at the head of Indian River, Florida. It was associated with Byth. æquicostata, Hydrobia Wetherbyi, Goniobasis papillosa, Planorbis scalaris, Physa pomilia and Vivipara Georgiana.

The shell seems most nearly allied to *B. obtusa* and *Aldrichi;* having the same *truncated* appearance caused by the depressed form of the earlier whorls, while the last two form a rather cylindrical body. The whorls are more convex than in *B. obtusa* and the umbilicus far larger, it being scarcely obvious in *B. obtusa*. *B. Aldrichi* is a smaller species, with different aperture.

A NEW SPECIES OF NANINA.

BY H. A. PILSBRY.

Nanina Ruschenbergeri Pilsbry.

Shell large, depressed, thick and solid, rudely striate, deeply and perspectively umbilicated.

Solid and strong, opaque. The specimens are dead, lusterless and destitute of epidermis, of a dirty-white color with either (1) a single narrow peripheral brown girdle, the umbilicus brown inside, or (2) a broad brown girdle encircling the middle of the whorl, or (3) the upper surface of the last whorl brown except for a light girdle just above the periphery, below which there is a broad zone, its lower edge fading out on the base, the periphery itself marked by a narrow darker band: in all the forms the umbilicus is brown inside and the whorls of the spire light, the apex somewhat rufous. The surface has very coarse and uneven, irregular, oblique striæ above; they are weaker below; and under a lens, close incised spiral lines become visible, making the surface granulate; they are nearly obsolete on the body-whorl, but usually distinct inside the umbilicus and on the earlier whorls. The spire is low, obtuse; sutures deeply impressed. Whorls 6, slowly widening, the inner three somewhat protruding above the outer; the last whor very convex above, obsoletely angled on its earlier portion, becoming rounded, shortly but decidedly deflexed in front. Aperture very oblique, rounded-lunate; peristome expanded on its outer margin, reflexed, blunt and much thickened on the basal and columellar margins. Umbilicus deep, permitting one to see to the apex, and funnel-shaped.

Alt. 22, greater diam. 42, lesser 37 mm.; width of umbilicus 8 mm.; oblique alt. of mouth (meas. outside perist.) 21, width 21 mm.

Another specimen measures: Alt. 22, diam. 45 mm.

Habitat, Liu-Kiu Is. (Dr. Ruschenberger.)

This is a very solid, heavy form, apparently belonging to the group of *H. pallasiana* Pfr. but very different from that species in its much more convex whorls, deeper suture, more broadly expanded umbilicus, and in the rounded body-whorl, the earlier part of which is very acutely carinated in *H. pallasiana*. There are four specimens before me, one of them about half grown, the others adults. The young shell is very obtusely angled at the periphery; the striæ are minutely granulated. The embryonic shell is large, about one-fifth the diam. of the adult, composed of about 2¾ whorls, of which the outer 1½ are finely, distinctly granulate, the inner ones having low, curved, radiating little folds. The termination of the embryonic shell is marked by a distinct line.

EASTERN NEW YORK NOTES.

BY W. S. TEATOR, UPPER RED HOOK, N. Y.

To our list of mollusca inhabiting this Duchess County region, Mr. Gilbert van Ingen of Poughkeepsie has recently made some good additions, among them, these: *Patula asteriscus*, *Pupa simplex* and *Zonites internus*.

The first named, *asteriscus*, was discovered under the mould in a swamp near the city. Mr. van Ingen in a letter to me gives the following: "The locality where I found them is known as 'The Glen' at Vassar College. It is a small deep valley worn out by a stream in the hills of drift. Through the center of the narrow strip of level land at the bottom flows the stream, on either side of which is the swamp. The soil is fine black muck and is very wet and cold." But two specimens were found at first, and later two more were taken.

Of *Pupa simplex* about a half dozen were obtained in the same place, under moist leaves.

Zonites internus is one of those which are out of place here so far east, though it has been reported at Albany. Mr. van Ingen found a few live specimens and a number of dead ones on the hills opposite Poughkeepsie during the latter part of last March.

WEST AMERICAN NOTES.

BY C. R. ORCUTT, ORCUTT, CAL.

HALIOTIS RUFESCEN *Swains.* In the NAUTILUS, iv, 59, Mr. Henry Hemphill cites a Lower Californian locality for this species. I have also found this species at the same point at La Playa de Santo Tomas, Lower California, but have never found it or heard of it at San Diego or at intermediate points. Santo Tomas (*not* San Tomas as Mr. Hemphill writes it) is about 75 miles south of San Diego on the Pacific Coast of the Californian peninsula.

HELIX CARPENTERI, *Newcomb.* Dr. L. G. Yates (NAUTILUS iv, 51) refers a form of Helix from near "Indio, San Barnardino Co., California" to this species. If I remember rightly Dr. Bowers collected these to the south of Indio at the eastern base of the San Jacinto mountain range, in San Diego County, Indio, a station on the S. P. Ry., is also in San Diego County. What I take to be the same shell I have collected in the same region, in Palu canon, along Snow Creek, etc., where the dead or "fossil" shells are often very numerous, but living specimens are correspondingly rare. I believe at the proper season an abundance of living examples might be obtained among the rocks, as many of my specimens were plainly recent, and none of those observed, could I describe as in a fossil state. I consider it merely a form of Helix Traskii Newcomb, but for that matter H. Carpenteri is worthy of no greater consideration.

PHYSA. In my botanical work on the Colorado Desert, San Diego county, California, I have also a good opportunity to study the geology of this interesting and little known region, and the fauna as well as the flora. The millions of fresh water shells scattered over this desert are well known, and a review of the subject of their occurrence there, is now in press. In a recent visit to Yuma, Arizona, and the neighborhood of Ft. Yuma, California, I was enabled to make another interesting observation in relation to their occurrence. At Hanlon's Ferry, a few miles south of Ft. Yuma, on the west bank of the Colorado river, a mining company has erected a tank with a capacity of four thousand gallons. This was put up nearly a year ago (September 1889) and has not since been cleaned out, though nearly emptied twice a week. In this tank I was pleased to find thousands of living Physas, some quite large examples. The tank is applied from a 6 inch well, and no shells were

found alive in the Colorado river, only a few hundred feet away. This brings up some interesting questions relating to geographical distribution, of which the writer may treat later.

FOREIGNERS. *Limax maximus* has appeared in San Diego gardens; *Helix nitidus* is also not rare at San Diego, and hundreds were found in the grounds of the University of California, at Berkley, recently. The trunks of several Australian tree ferns have also afforded a Helix and one or two slugs new to the writer.

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

OCTOBER 1, 1890.

President, JOHN H. CAMPBELL.
Vice-President, JOHN FORD.
Secretary, CHAS. W. JOHNSON.

Since last announcement the following new members have been enrolled in the Association:

98. Wm. J. Fox, Philadelphia, Pa. *Cerithiidae and shells of New Jersey.*

99. Mrs. E. P. Gaylord, Detroit, Mich. *Cypraeidae.*

100. Prof. J. B. Steere, Ann Arbor, Mich.

Several applications are pending. It would facilitate the admission of applicants, if they would refer to some member of the Association, with whom they are acquainted either personally or by correspondence.

Mr. H. A. Pilsbry, Conservator of the Conchological Section of the Academy of Natural Sciences, (at the suggestion of the President of the Association), has commenced the formation of a special exhibit of United States Shells. It is his intention to have every species of mollusk found in the United States, represented in the collection, and if the members of the Association will assist in the work, he will so arrange it, that none but members shall contribute specimens, in order that the collection may be the special exhibit of the American Association of Conchologists. If the idea is successfully carried out, similar collections may be formed in other cities of the United States, so that any person wishing to identify a species, will have the material accessible for reference, to enable him to do

it. The specimens are to be deposited in the Museum of the Academy of Natural Sciences for permanent exhibition. In order that the collection may be a credit to the Association, none but the finest kind of specimens will be accepted and the exact locality of every specimen contributed must be designated. The matter of contributing to the collection, will be, of course, purely voluntary on the part of members, but it is urged upon them to take an interest in the matter, for two reasons, viz: 1st. A complete, special collection of all the mollusca of the United States will be valuable for purposes of reference, identification of species, settlement of disputed nomenclature, classification, and general scientific interest. 2nd. It will be a work, which will redound to the credit of the Association, by showing what the members are capable of doing, when united in gathering material for a great National Collection. The name and address of each donor will be attached to the cards upon which the specimens will be mounted. Members, who are willing to assist the project, will please let the President of the Association know what specimens they can contribute to the collection.

Inquiries have been made by members, as to the best general works of reference in the study of conchology. We would recommend Tryon's Structural and Systematic Conchology, Phila., 1884 and Dr. Paul Fischer's Manuel de Conchyliologie, Paris, 1887. Both of them are invaluable to the student. Any bookseller in America can obtain them.

Mr. Henry Hemphill in his recent Catalogue of North American Shells, suggests some startling changes in the nomenclature of American Helices—mainly in the proposed reduction to varietal rank of a number of species recognized by Mr. Pilsbry and other authorities. In Mr. Pilsbry's subgenus Polygyra (including Polygyra, Mesodon, Triodopsis and Stenotrema) the following changes would be made if Mr. Hemphill be correct:

Andrewsi, W. G. B.=var. albolabris, Say.
appressa, Say=var. palliata, Say.
armigera, Ancey=var. Columbiana, Lea.
binominata, Tryon=var. devius, Gould.
Dorfeuillana, Lea=var. Texasiana, Moric.
exoleta, Binn.=var. albolabris, Say.

fallax, Say=var. tridentata, Say.
hirsuta, Say=var. stenotrema, Fér.
Hopetonensis, Shutt.=var. tridentata, Say.
inflecta, Say=var. tridentata, Say.
introferens, Bland=var. tridentata, Say.
Mooreana, W. G. B.=var. Texasiana, Moric.
Mullani, Bland=var. devius, Gould.
Rugeli, Shutt.=var. tridentata, Say.
Salmonensis, Tryon=var. devius, Gould.
Sanburni, W. G. B.=var. devius, Gould.
thyroides, Say=var. albolabris, Say.
triodontoides, Bland=var. Texasiana, Moric.
uvulifera, Shutt.=var. auriculata, Say.
Van Nostrandi, Bland=var. tridentata, Say.
Wetherbyi, Bland=var. Roemeri, Pfr.

It would be an excellent thing, if those members of the Association, who are interested in American Helices, would communicate with the Secretary, giving their opinion upon the proposed changes of Mr. Hemphill. The Communications would afford a basis for comparing notes and obtaining a concensus of opinion upon the subject, which would make an interesting article in the next number of the NAUTILUS.

THE SHELL-BEARING MOLLUSCA OF RHODE ISLAND.

BY HORACE F. CARPENTER

198.—*Yoldia limatula*, Say., 1831.

Syns.:

Nucula limatula, Say, Gld., DeKay, Con., Sby., Migh., etc.
Leda limatula, Stimp., S. I. Smith.
Yoldia limatula, Modern authors.

Shell transversely ovate, thin and fragile, translucent; posterior end lengthened and narrowed to a rostrum or snout; beaks nearly central, not prominent; surface smooth and shining with minute lines of growth; epidermis very glossy, light green with lighter and

darker radiating zones; interior bluish white, pearly; hinge with eighteen teeth on the posterior, and twenty-two teeth on the anterior side of the beaks. Length two inches, height one inch, breadth one half.

It inhabits from Long Island to Newfoundland fine, soft mud at a depth of from two to ten fathoms. They are very abundant and of large size at Portland, Me., but are much smaller in Rhode Island. The only place where I have been able to dredge them in Narragansett Bay is off Rumstick, at the mouth of Warren River in company with *Nucula proxima*, Say.

(*To be continued.*)

GENERAL NOTES.

James C. Cox, M. D., the well-known Australian Conchologist, has recently published descriptions and figures of *Ancylus Smithi* and *Cypræa Irvineanæ*, both from Australia. The latter is said to group with *Cypræa stolida, brevidentata* and *coffea*. (Proc. Linn Soc. N. S. Wales, iv, p, 660, plate xix.)

A fine specimen of the rare *Conus gloria-maris* (of which only about a dozen are known) has been secured by Mr. Hermann Rolle (whose advertisement will be seen in this number.) The specimen is valued by him at $500.

Mr. E. A. Smith of the British Museum has published a very acceptable list of the marine mollusks of the Island of St. Helena in Proc. Zool. Soc. London for 1890. Many new species are described. An unexpectedly large number of West Indian types appear.

CYPRÆA SPADICEA. I noticed that in the July NAUTILUS Miss Ida Shepard tells of finding *Cypræa spadicea* at Longbeach. It has been found here (Santa Barbara) alive, and dead shells are not rare. This is some hundred miles further north than her locality. I have thought that Point Concepcion forty miles above, might be its northern limit, but have no data to prove it. The one captured here, lived two or three days in a bowl of sea water, giving us an opportunity to study its beauties.—*Sarah E. Boyce, Santa Barbara, Cal.*

PUBLICATIONS RECEIVED.

DESCRIPTIONS OF NEW WEST AMERICAN LAND, FRESH-WATER AND MARINE SHELLS, by Robt. E. C. Stearns, Adjunct Curator of the Dept. of Mollusks, U. S. Nat. Mus. (Ex. Proc. U. S. Nat. Mus. xiii, p, 205.) In this excellent paper Dr. Stearns describes *Helix (Arionta) coloradoensis*, Grand Canon of the Colorado, opposite the Kaibab plateau, elevation of 3,500 ft; *H. (Arionta) magdalensis*, Magdalena, State of Sonora, Mex., elevation of 1000 ft. above the town; *Holospira semi-sculpta*, State of Chihuahua, Mex.; *H. arizonensis*, Dos Cabezos, Arizona; *Melania (Goniobasis?) acutofilosa*, Eagle Lake, Cal., a form allied to *G. occata; Cyclothyca*, a new subgenus of *Capulus*, with the species *C. corrugata*, West coast of Nicaragua; *Mitra nodocancellata*, Gulf of Cal.; *Venericardia barbarensis*, off Santa Barbara Is., Cal.; *Lucina æquizonata*, same locality; *Venus (Chione) effeminata*, Panama Bay; *Periploma discus*, San Pedro, Long Beach, etc. *Venericardia borealis* Conr. and *V. ventricosa* Gld., and *Miodon prolongatus* Cpr., are also figured. Of the West Coast Helices Dr. Stearns says: "I agree in the main, if not entirely with Mr Pilsbry in his remarks as contained in the paragraph under Lysinoë in Nomenclature and Check-list of N. A. Land Shells, p, 193, criticising the generic terms, etc., heretofore applied to the helices of the Pacific slope, but I do not perceive the propriety of substituting the generic name *Lysinoë* H. & A. Ad., 1855, any more than *Aglaia* Albers, 1860, for *Arionta* Leach, 1820. As for *Helminthoglypta*, *Micrarionta*, *Euparypha* etc., as applied to the West Coast snails, there is nothing in them more or less than a beggarly threshing of beaten straw, not a grain of wheat; or in other words, neither propriety nor advantage in their use"! Under *Holospira* a useful list of all known species is given, with critical remarks. Under the description of *Goniobasis*, doubts are expressed as to whether the western Melanians belong to *Goniobasis*—a subject already noticed by the Editor in the last NAUTILUS.

The subgenus *Cyclothyca* is proposed for a curious form like a depressed *Stomatia phymotis*, somewhat, probably parasitic on Echinus. The plates, three in number, are beautiful examples of photo-engraving.—*H. A. P.*

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OF CONCHOLOGISTS.

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H. A. Pilsbry, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR:
C. W. Johnson, Acting Curator Wagner Institute of Science.

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THE NAUTILUS.

VOL. IV. NOVEMBER, 1890. No. 7.

A GLANCE AT THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

BY JOHN FORD, PHILADELPHIA.[1]

The present building of the Academy of Natural Sciences of Philadelphia fronting on Logan Square, is a very large one, but the new structure, of which a perspective view is given on the opposite page, will be quite double the size; the front of the latter on 19th St., being 155 feet; and that on Cherry St. 130 feet, thus giving an additional surface area of 20,150 square feet. Four tiers of galleries 32 ft. wide will surround an open central hall, the whole illuminated by an arched glass roof springing at a height of 80 ft. above the floor. Added to these will be many rooms for Laboratory, Office and other purposes. The society for whose accomodations this noble edifice is being erected, is the oldest of the kind in America, it having been founded in 1812 by a few earnest seekers after knowledge. Since then many hundreds of names, among them a large number well known to-day, have been added to its membership. It is not strange, therefore, that for many years the society's decisions have had great weight in the scientific world.

In addition to its contributions to the progress of science through the publication of discoveries and investigations, and courses of popular lectures, it has established a museum of natural objects equal in many respects to the finest known. In this vast aggregation there

[1] EDITOR OF NAUTILUS, DEAR SIR: Accompanying this communication please find a picture of the building of the Academy of Natural Sciences of Philadelphia, as it will appear when the addition now under construction is finished.

are thirty thousand birds including the Gould collection of Australian species, the Bonaparte collection of European species and Verreaux series from Asia and Africa.

The collection of fossils, which is being systematically arranged by Prof. Angelo Heilprin, Curator-in-charge, contains some 20,000 trays of specimens besides a larger number of original types of American Tertiary fossils than all other collections in existence.

The Minerals, including the superb collection of the late Wm. S. Vaux, equal in numbers and beauty the best in the country.

Of no less interest and value is the collection of Insects which in extent and completeness is almost unrivaled. Nor less instructive and attractive is the Herbarium with its vast number of specimens, including 35,000 species of flowering plants.

Many other equally important collections are contained in the Museum.

Among these may be mentioned the Fishes, Reptiles, Corals, Sponges and Crustaceans, all of which are largely represented.

There are also some 1,700 specimens of human Crania and a host of Archaelogical objects.

But of more especial interest, perhaps, to the readers of the Nautilus is the Conchological collection.

This is equal in all respects to the best in the world, and superior to all in the systematic arrangement of the specimens. There are fully thirty thousand species and named varieties in the collection, these embracing nearly a half million of specimens, the majority of which were presented from time to time by prominent Conchologists whose knowledge and means enabled them to select and secure the best examples available. To this fact may be ascribed much of the beauty and value of the collection.

As already stated the arrangement of the collection is superior to any in the world, and this is directly due to the careful study and matchless executive ability of the late Mr. Tryon who planned it in accordance with the design previously prepared by him for his masterly work the Manual of Conchology.

He did not live to see the entire fulfilment of his wishes but they are being faithfully carried out by his friend and sometime assistant, Mr. H. A. Pilsbry, the present conservator of the department and Editor of the Manual.

The primal group in the arrangement is a synoptical one embracing all of the principal genera known.

With each of these are a sufficient number of species to make the generic distinctions at once apparent, thus enabling the student to locate in the general collection any genus he might wish to examine.

Following this group are the genera with their full complement of species, the bulk of the latter represented by specimens, the remainder by figures or models.

First in line are the Cephalopods, which as your readers know, comprise the highest class of the Mollusca.

Only a few of these produce shells that are wholly external. A fine display, however, of those belonging to the Nautilus and Argonauta are to be seen, together with many rare models of shell-less species.

Near these are several trays of frail glass-like shells belonging to the class Pteropoda. Of this class quite a number of genera are represented making a very dainty and delicate group.

Next in order comes the Marine Gastropods, a class containing a far greater number of genera than either of the others named. Included in these are the Murices, Tritons, Purpura, Volutes, Fusus, Mitra, Marginella, Olives, Cones and Cypraea.

In all of these are rare and costly specimens, while some of them show an almost complete series of the species.

This is especially so as regards the Cones, Olives and Cypraea, the last being the largest and finest collection of its kind in the United States save that belonging to John H. Campbell Esq. of Philadelphia, which is indeed worth a long journey to see. Exquisite specimens are also plentiful in the other genera mentioned. Passing from these the visitor will meet with many series of genera belonging to the same class. Though less prominent, perhaps, than those left behind, they are in some respects quite as interesting.

Among them is the genus Cerithium, a group of wax-like shells, whose "quaint and curious" forms make them delightfully attractive. Here too are the Littorina, the Turbo, Trochus, Phasianella and many others including the genus Haliotis which in beauty, number of species and size of specimens, can fairly claim the attention of all lovers of Nature's handiwork.

Near to these are the Patella, Bulla and Chitons, all of which are worthy of attention, though among the last of the Marine Univalves.

Here also, near the center of the west gallery, are located the cases intended for a special collection of all molluscous species belonging to the United States.

The idea of this collection emanated from the President of the American Association of Conchologists and there is every reason to believe that the members will agree with him and show their appreciation of the project in offerings of the best specimens obtainable near their respective homes. Just beyond these, in cases and drawers, can be seen a majority of all the fresh water species of the world, including the types of Rafinesque, Say, Conrad, Tryon, Haldeman Gabb and others, and a series of duplicate types of Lea's Unionidæ.

The series of Land Shells commences with *Oleacina*, a genus chiefly confined to the U. S. Gulf States and Central and South America. A majority of the species are shown, and as many of the shells are translucent, the visitor, for this and other reasons, will find them both interesting and instructive.

The same translucent, and in some instances transparent, character is also finely illustrated among species of *Vitrina* in a case near by. Just beyond the latter are several families containing a comparatively large number of genera. Of these the most familiar are *Gibbus, Zonites* and *Nanina*, the arrangement of which is entirely completed, a task that only expert conchologists can fully appreciate. In *Zonites* and *Nanina* many beautiful gems are presented, though none so singular in form, perhaps, as are the species *Lyonettianus* and *pagodus* in the genus *Gibbus*.

Next come the typical Helices, a genus containing some 3,400 species. An enormous number indeed to be of one kin. Among those exhibited are many specimens remarkable for size, perfection of finish, and the rare combination of colors adorning their surfaces. With these can be seen *H. picta*, from Cuba, with its forty color varieties, each "a thing of beauty and a joy forever;" *H. Gibboni* with its white and chestnut-colored crescents; and *H. Polygyrata* whose many whorls are alike suggestive of giddiness and French horns. Also scores of others no less enchanting though hailing, with their less favored brothers, from all continents and islands of the world. In the same family is that wonderful group known as the *Cochlostyla*. This comprises many sub-genera, including the typical *Cochlostylus* of Ferrussac. The group, however, as it is understood, embraces nearly all of the Helicoid and Bulimiform land species belonging to the Philippine and adjacent islands.

Nothing but superlatives of the highest order can do justice to the superb appearance of this group. Where each species exhibits a style of beauty peculiar to itself, and all are charming, any special reference to individual perfection would seem invidious.

Some, it is true, show a higher caste of beauty than do others, but none the less are they all graceful and fair to look upon. With slight modifications these remarks will also apply to the genus *Bulimus* in an adjoining case. This group is not so patrician in general appearance, but a large percentage of the species are sufficiently handsome to create a desire for possession in the heart of the collector.

Nor would this desire be lessened on his beholding, a few feet away, the grand display made by the genus *Achatina*, many species of which are quite large, symmetrical in form and radiant with color.

Following these, with an almost complete complement of species, are still many families belonging to the *Pulmonata*.

Among this number, the best known are the *Achatinellidae*, the *Cylindrellidae, Pupidae, Succineidae* and *Auriculidae*.

All are rich in species especially interesting to the student, and possibly so to the casual observer; but lack of space prevents any further allusion to them at present. For the same reason but little reference can be made to the multitude of bivalves still unnoticed. These belong to the Class Pelecypoda, and are chiefly marine. Among the most beautiful of the genera are the *Tellina*, *Cytherea*, *Tapes*, *Cardium*, *Trigonia*, *Spondylus* and *Pecten*. These are the queens of the Class, though many other genera are endowed with species but little inferior either in form or color.

Few, however, can rival the regal beauty of *Tellina radiata, Cytherea erycina, Tapes literata, Cardium pseudolima, Trigonia margaritifera, Spondylus princeps, Pecten pallium* and other species gracing their respective genera. All gems, rare gems from ocean sands and caves

> "Where the foot treadeth not, nor the eye may scan;
> Deep, deep from the haunts and the homes of man."

Philadelphia, October, 1890.

NOTES ON BULIMULUS DORMANI W. G. B.

BY CHARLES T. SIMPSON, WASHINGTON, D. C.

In the Oct. NAUTILUS Mr. Berlin H. Wright separates a form of *Bulimulus Dormani* from the type, calling it var. albida, and

makes the sweeping assertion that "*it is never found associated with the typical.*"

Such a statement is a very strong one, and would indicate either that the writer was thoroughly familiar with every locality in which the shell was found, or that others had searched over its entire area of distribution, and that all the facts regarding it were known. Such an amount of knowledge is scarcely possessed concerning any mollusk I know of. It is hardly safe to say with certainty that any shell of the later Tertiaries is extinct, that a species is never found outside of a given locality, or only under certain conditions, or that one form may not connect with another, because the army of lynx-eyed collectors at work now are creating continual surprises in such matters, bringing the dead to life and finding forms in just the places and under just the circumstances that other persons have said they could not.

While living at Braidentown, Florida, I found Bulimulus Dormani quite abundant, living and dead, in heavy hammock lands north of the Manatee River, and with the typical form, *on the very same trees*, I found quite a number of specimens without a vestige of color! The ground of most of these shells was a lovely pale porcelain, the spots were usually reddish brown, sometimes forming uninterrupted bands somewhat clouded, or more or less distinct; and between these and the unicolored shells, there was almost every variation. Some of the specimens were a uniform horn color, others a waxen or porcelain tint. There was also quite a range of variation in size and solidity; some shells measuring one and a fourth inches in length, others that I believed to be adult were not over three fourths of an inch long; some were quite solid for so frail a species, and others so fragile that they could be blown to fragments with the breath, and it was next to impossible to collect or handle the latter. Many of these were quite inflated, others attenuated, and I am inclined to believe that *B. marielinus* s only a dwarf, elongated form of this same shell.

In the collection of the U. S. Nat. Museum, there are a couple of shells (No. 29612) collected by W. W. Calkins, with only Florida given as a locality, and labelled *Bulimulus Floridanus* Pfr. These agree quite well with the figures of that species (448) in Binney's Manual of North American Land Shells, p. 407. The texture is more solid than *B. Dormani* or *Marielinus* as I have seen them, the whorls are somewhat convex, the last sub-angulated below the mid-

dle, the columella and aperture agree fairly well with the description, but the color is a uniform brownish buff, darker slightly on the base. They are close to certain unicolored forms of *B. virgulatus*, Rve. of the West Indies, and certainly seem different from anything I have seen bearing the name of *Dormani*, *Marielinus* or *Floridanus*. Mr. Calkins collected several years in Florida for the Chicago Acad. Nat. Sciences, published a catalogue of Florida shells and furnished a good deal of material for the Nat. Museum, and his localities seem to be reasonably accurate. I may remark in passing that *B. stramineus* Guild., of the Isle of St. Vincent, is extremely close to the unicolored forms of *Bulimulus Dormani*.

DESCRIPTION OF A NEW SPECIES OF ANCTUS.

BY JOHN FORD.

Anctus Pilsbryi, Ford, N. Sp.

Shell rimate-umbilicated, ovate-conical, spire acute, apex black: whorls 7, slightly convex, the last somewhat constricted near the base. Aperture extremely narrow, oblong; lip flatly reflected, the central portion for about two-thirds of its length provided with a flange extending toward the inner or columellar lip from which proceeds a corresponding convexity thus giving to the aperture a form much like the traditional key hole. Color light gray, painted longitudinally with brownish and black lines.

Length of shell 23, length of aperture 12, width between flanges 1 mill, width of flange on outer lip 2 mill. Color of lip white.

Habitat Brazil.

Anctus angiostoma and *A. Pilsbryi* are the only living species of the subgenus known and they are in some respects very much alike. In the former, however, the apex is not black and shining nor are the apertures at all alike, save in general outline. Indeed that of *A. Pilsbryi* is absolutely distinct from any other known to the writer. This alone would justify its specific separation, and it will be a miracle perhaps if a form so peculiar does not appeal to the genus makers as well.[1]

Phila. Pa., Oct. 13th, 1890.

[1] The above description is chiefly drawn from memory, as the shell was unfortunately mislaid before the less salient features were thoroughly verified. It can be understood, however, that all of the characters given above are approximately correct.

SHELLS WITHIN CITY LIMITS.

While hunting for fossils in an old stone yard in Sedalia, I found that the *Pupa fallax*, Say, was quite plentiful, some stones of the size of a hand having nearly one hundred shells on the under side. Short searches on three different days gave about 2000 *Pupa fallax*, 250 *Pupa rupicola*, and 10 *Zonites minusculus*.

The stone yard is in the suburbs, and is grown up with grass, being surrounded by unbroken prairie. I had never before found any land shells in the city, nor either species of *Pupa* so abundant in any other part of the county. My surprise was increased a few days after to get large numbers of *Vallonia pulchella* collected by Mr. R. A. Blair on a vacant lot within a block of the business center of the city, being the first record of this species being found in the State. Along with these latter shells, were found two *Zonites arboreus*. This year has evidently been a favorable one for shell life, as it has been in this county, also, for fruits and vegetables.

Sedalia, Mo. F. A. Sampson.

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

October 21, 1890.

Since date of last announcement the following new members have been enrolled in the Association:

101. W. S. Teator, Upper Red Hook, N. Y.

102. C. A. Whittemore, Grand Rapids, Mich. *Helicidae, Unionidae and Michigan shells.*

103. R. H. Pettit, Ithaca, N. Y.

104. Albert Bailey, Chepachet, N. Y.

The United States Collection.

The announcement in the last number of the Nautilus, of the proposed formation of a great National Collection of United States Mollusca, to be deposited for permanent exhibition in the Academy of Natural Sciences, Philadelphia, has excited much interest among the members, quite a number of whom, have signified their intention of contributing specimens. The following is a sample of letters received by the President:

Bloomington, Ill. Oct. 18, 1890.

John H. Campbell Esq., Dear Sir:

In the Oct. number of the Nautilus, I notice the proposition of H. A. Pilsbry to form a complete special collection of the shells of

the U. S. to be deposited in the Academy of Natural Sciences, Philadelphia. I am very much pleased with the scheme and hope it will be successful. From time to time as opportunity offers, I will make up a box and send to you or direct to the Academy as you may direct. I will send West Coast shells.

Very truly,

G. W. Lichtenthaler.

Some of the Philadelphia members of the Association have already responded to the suggestion and have contributed some very handsome specimens as a nucleus for the collection. The full list of donations thus far made is noted below and from month to month the NAUTILUS will publish a list of additions made between the dates of issue.

It would be well to bear in mind the following rules:

1. None but members of the Association will be allowed to contribute to the collection.

2. None but the finest kind of specimens will be accepted.

3. The specimens must be from known, exact localities within the limits of the United States.

4. The donation of shells is purely a voluntary matter on the part of members.

5. The names and addresses of the donors will be written on the cards upon which the shells will be mounted.

The donations must be voluntary.

It must be understood that the matter of contributing specimens to the collection is purely a voluntary one on the part of members. There is no obligation on their part to contribute, or even to take an interest in the matter. Some of them may not care to donate specimens to be placed in the Philadelphia Academy, but may prefer to help along collections in their own localities. The collection will be labelled "Special Exhibit of United States Mollusca, contributed by members of the American Association of Conchologists," but the Association, as an organized body will not stand sponsor for the Exhibit. It could not do so without a meeting and a favorable vote by the members.

This will not prevent, however, members, who desire to do so, from contributing to the success of the project, and the Philadelphia members would be glad to have the help of all who look kindly upon the project.

All specimens should be sent addressed to the President, care of the Academy of Natural Sciences, 19th and Race Sts., Philadelphia. The president is a member of the Academy and generally manages to visit that institution once a week, to meet his fellow conchologists, and the specimens sent will receive his personal attention.

Donations to date.

The following species have been already received and mounted. All of the specimens are as fine as possible and include a number of valuable suites. The numbers prefixed to the names are the numbers of the trays.

John Ford, Philadelphia, Pa.—

2, Solen Americana, Gould, Atlantic City, N. J.; 10, Same, juvenile suite; 7, Mactra solidissima, Dillwyn, Atlantic City, N. J.; 8, Same, juvenile suite; 6, Littorina irrorata, Say, Atlantic City, N. J.: 31, Pupa contracta, Say, Philadelphia, Pa.

Charles W. Johnson, Philadelphia, Pa.—

3, Planorbis tumidus, Pfr., St. Augustine, Fla.; 4, Siphonaria lineolata, D'Orb., St. Augustine, Fla.; 5, Urosalpinx Tampaensis, Conrad, Lostman's Key, Fla.; 12, Ovula uniplicata, Sby., St. Augustine, Fla.; 13, Lucina squamosa, Lam., Stump Pass, S. W. Fla.; 14, Macoma Tampaensis, Conrad, Gordon's Pass, S. W. Fla.; 15, Helix uvulifera, Shutt., Sanibel Island, Fla.; 16, Chondropoma dentata, Say, near Gordon's Pass, S. W. Fla.; 17, Odostomia impressa, Say, St. Augustine, Fla.

H. A. Pilsbry, Philadelphia, Pa.—

20, Helix cereolus, Mühl., var. Febigeri, Bld., New Orleans, La.; 21, Helix monodon, Rack, var. fraterna, Say, near Lake Charles, S. W. La.

Joseph Willcox, Philadelphia, Pa.—

22, Turitella plebeia, Conrad, Miocene, St. Mary's, Md.; 23, Arca aviculaeformis, Heilprin, Pliocene of the Caloosahatchie, Fla.; 24, Nassa peralta, Conrad, Miocene, St. Mary's, Md.; 25, Cypraea (Siphocypraea) problematica, Heilprin, Pliocene, Caloosahatchie, Fla.; 26, Physa Meigsii, Dall, same locality; 27, Voluta Floridana, Heilprin, same locality; 28, Chama crassa, Heilprin, same locality; 29, Cardium laqueatum, Conrad, Mio-

cene, Patuxent R., Md.; 30, Lucina Floridana, Conrad, Estero Bay, S. W. Fla.

William J. Fox, Philadelphia, Pa.—
32, Cerithium atratum, Born., San Marco, S. W. Fla.; 33, Cerithium muscarum, Say, Gordon's Pass, S. W. Fla.

John H. Campbell, Philadelphia, Pa.—
1, Cypraea exanthema, Linn, near Key Largo, Fla.; 9, same, juvenile forms; 11, Vitrizonites latissimus, Lewis, Roan Mt., Tenn.; 18, Trophon Belcheri, Hinds, San Diego, Cal.; 19, Cypraea spadicea, Swainson, San Diego, Cal.

Total—23 genera, 30 species, 33 trays.

GENERAL NOTES.

Some American Cannibals.—Ed. Nautilus, Dear Sir.—During a recent stroll in Fairmount Park I found beneath an old railroad tie about thirty healthy looking *Limax agrestis*, Linn. These I placed in a small collecting box which already contained quite half as many *L. campestris*, Binney.

On opening the box a half hour later I found, to my surprise, that two of the *campestris* were rapidly disappearing within the jaws of a pair of *agrestis*.

Having no means to separate the species I closed the box again and left it so for about twelve hours.

Upon reopening it there was but one *campestris* living. With exception of a few reddish stains not a vestige of the others could be discovered.

Of course the living one could tell no tales, but the fact remained that all the rest of its kindred had involuntarily evolved into *Limax agrestis*, Linn.

Moral, when *Bulls* are near let Conservatives beware.—John Ford, Phila., Oct. 1890.

Exchange.—I have for exchange twenty-five species of Unios from Illinois and Spoon river, including about two hundred very fine *Anodonta suborbiculata* Say.

Wanted other Unios and Sea shell.—Dr. W. S. Strode, Bernadotte, Ill.

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DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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THE NAUTILUS.

VOL. IV. DECEMBER, 1890. No. 8.

A NEW AMERICAN PISIDIUM.

BY EDWARD W. ROPER, REVERE, MASS.

Pisidium Idahoense Roper.

Shell large, sub-ovate, full, oblique, inequilateral, anterior end a little longer, margin well rounded; beaks scarcely raised, not prominent, approximate at apex; lines of growth delicate; epidermis glossy, light yellow, some specimens with brownish zones in center of valves, not extending to the edges, leaving a broad marginal border; interior bluish white; hinge margin curved, narrow; cardinal teeth very small, lateral teeth long and slender.

Length, 0·35; height, 0·31; breadth, 0·21 inches.

This shell is quite different from *Pisidium Virginicum*, the only American species of equal size. *P. Virginicum* has the beaks fuller, more elevated and nearer the posterior end; the hinge margin and teeth broad and heavy; the shell more elongated and in every way more solid.

About forty specimens of *P. Idahoense* were collected by Mr. Henry Hemphill in a muddy slough near Old Mission, in northern Idaho. He did not find it in other localities.

NOTES ON FLORIDA BULIMULI.

BY G. W. WEBSTER, LAKE HELEN, FLA.

In the Nov. NAUTILUS Mr Chas. T. Simpson gives some notes on *Bulimulus Dormani* which I have read with interest. As to the

Var. *albida* so named by my friend Mr. B. H. Wright, I wish to offer a little further explanation, that Mr. Wright nor I have ever found typical *B. Dormani* associated with spotless *Bulimuli* would weigh nothing against Mr. Simpson's having found them near the Manatee River. I hope in the not far distant future to visit that region and see for myself, but at the same time Mr. Simpson never having found the light colored var. entirely remote from any typical *Dormani* would not prove anything against there being a locality near Lake Helen where they are to be found at least 10 or 12 miles from a single specimen of well marked *B. Dormani*, and that there is such a locality I am very positive. I think they were first found about three years ago by my son Oscar B. Webster and myself.

They are to be found in a small hammock of probably less than 200 acres, so isolated from any other hammock as to render communication with any other *Bulimuli* quite improbable. My own theory with regard to them is that having had a common origin with the *B. Dormani* in other parts of Florida, they have been so long separated from the typical form, hundreds, perhaps, thousands of years, that some peculiarity of food or situation has finally developed a type of very transparent, light colored and nearly spotless shells. These characteristics have become so constant that I have never seen a single example of them that I should consider a good representative of *B. Dormani*. There may be other localities where a type of similar shells, all so nearly alike, may be found but I shall be surprised if any such is ever found. That the same type is to be found in other localities along with typical *B. Dormani* would be very probable, but though we have spent many days and weeks looking for *Bulimuli* among the hammocks of the St. John's River and along the East Coast of Florida for nearly 250 miles, we have never yet met with any such shells. The only white *B. Dormani* we have found among the typical have been such as have evidently become faded on account of age.

Nearly two years ago I sent Prof. W. H. Dall three specimens of *albida* of which he wrote in reply, "Those *Bulimuli* without spots are just lovely." W. G. Binney wrote me Sept. 3, 1889, with regard to some of the *albida* that I had sent him, "The *Bul. Dormani* in yours of Aug 29, are much more interesting to me for their long narrowed form, than even for their marking. I hope some day to figure them." Two years ago when I first showed some of them to

Mr. Wright with the remark that "they would hardly pass for typical *Dormani*," he at first thought they would, but further examination convinced him that their peculiar markings were constant and quite striking. He is certainly mistaken in saying that they are always a pure white shell and entirely spotless. Many that we have found are prettily marked with three bands on the last whorl often very faint that corresponds to the three rows of spots on the typical *Dormani*. and many of them have just enough spots, very faint ones to show their relationship. However, the lightest *Dormani* I have seen in any other locality will show several times more spots and color than the darkest *albida* I have seen. All the Florida Bulimuli I have seen show more or less of bands on some examples, but these show much more trace of bands than the horn-colored Bulimuli that we have occasionally found along the east coast for a distance of 200 miles. That there are no typical *B. Dormani* in the hammock where the *albida* are found, I am quite sure, as it is only three miles from our home and we often go there and have looked over about the whole ground many times, finding I think 27 species of shells. We have found two types of Bulimuli near the east coast both of them much like Binney's No. 449, in form, but very unlike his 448. They are very fragile shells, one of them nearly white with conspicuous bands and the other plain horn color. Whether they are to be called *Floridana* or *Hemphilli*, I think that for the accomodation of collectors and students they should be distinguished by different names. If a collector should write to me for *B. Hemphilli* expecting to get a white banded shell and I should send him a horn-colored one he would have good reason for being disappointed. So far we have found them to be very rare shells.

CONCHOLOGICAL NOTES FROM OREGON.[1]

* * * During my recent visit to Oregon I had opportunities for seeing *Goniobasis plicifera* Lea living in the Columbia River near Astoria, mostly on stones in small pools along the rocky margin. Also *G. nigrina* Lea which occurs in large numbers in the brook running from several large springs near Susanville, Lassen Co., Cal., at an elevation of 4700 feet above the sea. The same species was noticed in a watering trough fed by a spring on the road

[1] A letter from Dr. W. H. Dall to the Editor of the NAUTILUS.

crossing the Sierra, a little to the south and west of Susanville, the elevation being about 5500 feet which I think is the highest altitude at which any Strepomatid has been collected.

Both these species have a smooth mantle-margin, *G. plicifera* being dark slate-color finely dotted with sulphur yellow while in *G. nigrina* the color is nearly black, inclining to slaty. It is probable, therefore, that all our American *Strepomatidæ* agree in this feature and that as Stimpson supposed we have no typical Melanians with a fringed mantle-edge.[1]

An interesting feature in the malacology of this region is the absence of *Unio* from all the streams, though found fossil in the tertiary of this region. I found *Margaritana margaritifera* of normal form and size abundant up to a height of over five thousand feet above the sea level, in the northern Sierras. At this height it was not accompanied by *Anodonta*.

It is very remarkable that typical *Vivipara* occurs not uncommonly in the Pliocene or possibly the Quaternary fresh water shell-marl of the old Lake beds, both of the Snake River (Oregon) basin and the Lahontan basin (California and Nevada). Why *Unio*, *Lithasia* and *Vivipara* should have disappeared when their associated *Carinifex* and *Pompholyx* persist in the same vicinity specifically unchanged, is an inexplicable mystery at present. It shows at least that the West Coast fauna was formerly more intimately connected with that of the eastern region of the United States, than at present.

Another interesting feature of my visit was the determination, by the aid of the researches of that veteran geologist Prof. Thomas Condon of the State University, of the existence of marine Pliocene fossils at Shoalwater Bay, Wash. conformably underlying the quaternary and indicating, by the presence of *Buccinum cyaneum* and other northern forms, at that epoch a colder climate than at present. The most remarkable, and only new form in this bed is a fine *Mytilus* as large as *M. californicus* but distinguished from all other species of the genus by its surface which resembles that of *M. edulis* superimposed upon which are a few, strong, divaricating ridges extending from about the middle of the valves toward the posterior extreme.

---

[1] Alcoholic specimens of Western *Goniobasis* recently examined by me, sent by Mr. E. H. White of Astoria, Oregon, confirm the observations of Dr. Dall respecting the smooth mantle-edge. I hope to figure the dentition later.—Ed.

Many species have the surface covered with fine divaricating lines, but I believe there is none known in which there are a few strong distant ridges, perhaps not exceeding half a dozen on the surface of a shell six inches in length, and having otherwise the form and aspect of a giant *M. edulis*. For this interesting species I propose the name of *M. Condoni* in honor of its discoverer.

I did not succeed in reaching the southern part of the State where the enthusiastic lady collectors are upsetting all our previous notions by finding new species (and big ones, too,) in a fauna which everybody supposed had been well searched, to say nothing of advancing many Lower Californian types many miles to the north. I am beginning to believe that if the ladies set their minds to it we shall be having a lot of new species from New England next.

Prof. O. B. Johnson of the State University at Seattle, Wash., among other rarities, has recently dredged in the deep water of Puget Sound near Port Orchard, a few splendid specimens of *Cryptodon* or *Axinus bisectus* Conrad, originally described (as *Venus bisectus*) from the Miocene of Astoria. It is the giant of the genus, being over two inches in length, far surpassing in size any other living species yet known.

Wm. H. Dall.

A CATALOGUE OF CONCHOLOGICAL ABBREVIATIONS.

BY F. C. BAKER, ROCHESTER, N. Y.

The following pages comprise an alphabetical catalogue of the abbreviations in common use for writers on conchological subjects, together with their full names and nationalities.

While not exhaustive the names of all the more prominent writers upon the subject are given. It is therefore hoped that the list will prove useful to beginners and those more advanced in the subject as well.

A.

Ad. A.	Adams, Arthur.	English.
Ad. H.	Adams, Henry.	English.
Ad. C. B.	Adams, Charles B.	American.
Alb.	Albers, Johann Christ.	German.
Ald.	Alder, Joshua.	English.

Anth.	Anthony, J. G.	American.
Ant.	Anton, Hermann Eduard.	German.
	B.	
Berth.	Berthelot, Sabin.	French.
Bgt.	Bourguignat, M. J. R.	French.
Bk.	Beck, H.	German.
Blainv.	Blainville, M. H. de.	French.
Bld.	Bland, Thomas.	American.
Blf.	Blanford, N. T.	English.
Boettg.	Boettger, Dr. Oscar.	German.
Bourg.	Bourguinat, M. J. R.	French.
Brod.	Broderip, W. J.	English.
Brug.	Bruguiere, M.	French.
Brus.	Brusina, Spiridion.	Italian.
Binn.	Binney, Amos.	American.
	C.	
Calc.	Calcara, P.	Italian.
Cantr.	Cantraine, F.	French.
Carp.	Carpenter, P. P.	English.
Chemn.	Chemnitz, J. H.	German.
Conr.	Conrad, T. A.	American.
Coop.	Cooper, Dr. J. G.	American.
Couth.	Couthouy, J. P.	American.
Cpr.	Carpenter, P. P.	English.
Crist.	Cristofori, G.	French.
	D.	
Deb.	Debeaux, O.	French.
Desh.	Deshayes, G. P.	French.
Dillw.	Dillwyn, Lewis W.	English.
Dkr.	Dunker, W.	German.
Don.	Donovan, Edward.	English.
D'Orb.	D'Orbigny, A.	French.
Drap.	Draparnaud, J.	French.
Drp.	Draparnaud, J.	French.
Ducl.	Duclos, M.	French.
Dup.	Dupuy, D.	French.
	E.	
Eichw.	Eichwald, E. von.	German.
Esch.	Eschcholtz, Dr.	German.
Ehrenb.	Ehrenberg, Dr.	German.

F.

Fabr.	Fabricius, O.	Swedish.
Fbs.	Forbes, Edward.	English.
Fer.	Ferussac, J. B. L. D. de.	French.

(*To be continued.*)

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

DECEMBER 10, 1890.

Since the issue of the list of members, the following new members have been enrolled:

105. Prof. F. M. Witter, Muscatine, Iowa.

106. Miss Addie C. Appleton, Haddonfield, N. J. *Shells of New Jersey.*

107. Rev. Henry W. Winkley, Saco, Me. *New England Mollusca.*

108. Geo. W. Webster, Lake Helen, Fla. *L. and F. W. Shells of Florida.*

109. Oscar B. Webster, Lake Helen, Fla. *L. and F. W. Shells of Florida.*

110. James Shepard, New Britain, Conn. *Connecticut Mollusca.*

111. Prof. O. B. Johnson, Seattle, Wash.

112. J. G. Cooper, M. D., Haywards, Cal. *West Coast Mollusca.*

113. Mrs. Geo. Andrews, Knoxville, Tenn. *No. Amer. Land Shells.*

114. Chas. Russell Orcutt, San Diego, Cal. *Nudibranchiata.*

115. E. H. White, Astoria, Oreg. *Achatinella.*

116. Chas. L. R. Wheeler, Cape May, N. J. *Unionidae.*

117. J. J. White, Palm Beach, Fla.

118. John M. Clarke, Albany, N. Y. *Palaeozoic Mollusca.*

119. Wm. B. Marshall, Albany, N. Y. *Unionidae and New York Mollusca.*

120. Chas. Schuchert, Albany, N. Y. *Brachiopoda.*

121. Dr. Wm. H. Rush, U. S. N., Philadelphia, Pa. *Pteropoda and Heteropoda.*

122. Joseph Sayers, New Britain, Conn.

123. E. H. Fiske, Santa Cruz, Cal. *Fossil Shells of Pacific Coast.*

The following members have selected subjects, viz.:

Arthur F. Gray, Yonkers, N. Y. *West Indian Land Shells and Strophia.*

Prof. J. B. Steere, Ann Arbor, Mich. *Philippine Helicidæ.*

L. H. Streng, Grand Rapids, Mich. *Limnæa and Physa (No. America.)*

R. H. Pettit, Ithaca, N. Y. *L. and F. W. Shells of America.*

Albert Bailey, Chepachet, N. Y. *L. and F. W. Shells of New York.*

Rev. Geo. W. Taylor has removed from Stewarton, Ottawa, to Victoria, B. C.

The growth of the Association has been very gratifying and its value will be more and more appreciated as its list of members is increased. The officers constantly receive encouraging letters from the members.

The United States Collection.

The idea of the United States collection has been generally approved. Many of the members are enthusiastic. From the letters received and the shells promised, the collection bids fair to assume large proportions in a very short time. Starting with the first donations made by the officers and by Messrs. Pilsbry, Willcox and Fox of Philadelphia, announced in the last NAUTILUS, a box of shells, comprising 130 West Coast species, was received from G. W. Lichtenthaler, Bloomington, Ill. Some of the specimens and suites (particularly the *Haliotidae*) are magnificent and show the judgment of a trained collector and lover of shells. A fine lot, including some interesting fossils from the Miocene Silex Beds of Ballast Point, Florida, has also been received from Miss C. Antoinette Shepard of New Britain, Conn. Other donations have been received from Messrs. Thos. Morgan, Somerville, N. J., Joseph Willcox, Philip Nell, William J. McGinty, Wm. J. Fox and Mr. Campbell of Philadelphia, Wm. J. Raymond, Oakland, Cal.; Dr. W. S. Strode, Bernadotte, Ill.; Albert Bailey, Chepachet, N. Y.; and Chas. Le R. Wheeler, Cape May, N. J. They will be duly acknowledged. Mr. J. A. Singley, Giddings, Texas, writes: "I approve of the plan. I'll contribute some desirable Texas species to 'our corner' and will continue sending at times until I contribute some of everything I find in the State."

Mr. Geo. J. Streator, Garretsville, Ohio, writes: "I shall be glad to donate to the U. S. collection some of the best shells of this part of Ohio."

Mr. Geo. W. Webster, Lake Helen, Florida writes: "Myself and son shall be glad to donate examples to the U. S. collection. We are much interested in the subject."

These are but samples of the letters which are being constantly received. In sending specimens, members should avoid duplicating species already in the collection. None but the finest kind of specimens should be sent.

As the shells are received they are examined, prepared for mounting, named and then mounted upon cards, which fit into neat trays. Special attention is paid to the labelling, each species having the exact name and locality and name and address of the donor, thus:

> Haliotis corrugata, Gray,
> Catalina Id., Cal.
> G. W. Lichtenthaler, Bloomington, Ill., 1890.

Fossil species are placed with living species of the same genus, so that ready comparisons may be made between them.

Donations to United States Collection.

Since last announcement the following have been mounted and placed in the collection. The numbers attached to the names designate the trays. [Want of space in this number, compels us to defer part of the list until next month.]

G. W. Lichtenthaler, Bloomington, Ill.—

45, Purpura crispata, Chemn., Puget Sound, Wash.; 46, Purpura saxicola, Val., Monterey, Cal.; 80, Purpura canaliculatum, Ducl., Tillamook Bay, Oreg.; 79, Buccinum cyaneum, Brug., Alaska; 60, Siphonalia Kellettii, Forbes, Santa Barbara, Cal.; 59, Chrysodomus dirus, Reeve, Alaska; 48, Nassa perpinguis, Hinds, San Pedro, Cal.; 68, Amphissa corrugata, Reeve, Puget Sd., Wash.; 78, Crucibulum spinosum, Sby., San Diego, Cal.; 51, Crepidula adunca, Sby., San Diego, Cal.; 49, Vermetus squamigerus, Cooper, San Diego, Cal.; 86, Littorina scutulata, Gould, San Luis Obispo, Cal.; 85, Littorina Sitchana,

Phil., Port Townsend, Wash.; 90, Bittium filosum, Gould, Alaska; 82, Potamides (cerithidea) sacrata, Gould, Oakland. Cal.; 54, Trochiscus Norrisii, Sby., Catalina Ids., Cal.; 35, Haliotis Kamtschatkana, Jonas, Alaska; 36–37, Haliotis fulgens, Philippi, Catalina Ids., Cal.; 38, Haliotis corrugata, Gray, same locality; 39, Haliotis cracherodii, Leach, Cal.; 40, Haliotis rufescens, Swn., Santa Barbara Ids., Cal.; 41, Haliotis assimilis, Dall, San Diego, Cal.; 47, Lucapina crenulata, Sby., San Diego, Cal.; 60, Bulla nebulosa, Gould, San Diego, Cal.; 56, Selenites Vancouverensis, Sea, Vancouver, Wash.; 53, Helix fidelis, Gray, Oreg.; 52, Limnaea stagnalis, Linn., Seattle, Wash.; 50, Parapholas Californicus, Conrad, San Diego, Cal.; 43, Siliqua patula, Dixon, near Astoria, Oreg.; 42, Semele decisa, Conrad, False Bay, Cal.; 89, Cumingia Californica, Conrad, San Diego, Cal.; 55, Donax Californicus, Conrad, Lahoya, Cal.; 65, Venus fluctifraga, Sby., San Pedro, Cal.; 64, Tapes staminea, Conrad, Tongas Id., Alaska; 63, Cytherea (Pachydesma) crassatelloides, Conr., Cal.; 75, Sphaerium sulcatum, Lam., Salem, Oreg.; 87, Cardium consors, Brod., Tillamook Bay, Oreg.; 57, Cardium corbis, Mont., Tongas Id., Alaska; 88, Cardium (Laevicardium) elatum, Sby., San Diego Bay, Cal.; 91, Modiola capax, Sby., Monterey, Cal.; 93, Pecten latiauritus, Conr., Santa Barbara, Bal.; 44, Amussium caurinum, Gould, Port Townsend, Wash.; 62, Hinnites giganteus, Gray, San Diego, Cal.

C. Antoinette Shepard, New Britain, Conn.—

129, Fasciolaria tulipa, Linn. Key West, Fla.; 130, Ianthina communis, Lam., same locality; 131, Marginella carnea, Storer, same locality; 133, Littorina rudis, Don., Niantic, Conn.; 134, Crepidula glauca, Say, Wellfleet, Mass.; 135, Donax variabilis, Say, Fernandina, Fla.; 136, Pinna carnea, Gmelin., Key West, Fla.; 137, Pinna seminuda, Lam., Fernandina, Fla.; 138, Latirus Floridana, Heilp., Miocene Silex Beds, Tampa, Fla.; 139, Turritella Tampae, Heilp., same locality; 140, Crassatella deformis, Heilp., same locality. 141, Cardita serricosta, Heilp., same locality; 142, Cytherea nuciformis, Heilp., same locality.

Joseph Willcox, Philadelphia.—

128, Solenosteira Mengeana, Dall, Pliocene of Caloosahatchie, Fla.; 174, Niso Willcoxiana, Dall, same locality; 173, Fulgur

echinatum, Dall., Pliocene, Shell Creek, Fla.; 176, Orthalicus zebra, Müll., Florida Keys.

Wm. J. McGinty, Philadelphia.—

Marginella varia, Sby.; Unio orbiculatus, Hild., Ohio R.

Philip Nell, Philadelphia.—

153, Selenites concavus, Say, Philadelphia; 155, Anodonta fluviatilis, Lea, Delaware R., Phila.; 156, Patula alternata, Say, Philadelphia.

Wm. J. Fox, Philadelphia.—

34, Potamides (Cerithidea) scalariformis, Say, Indian R., Fla.; 125, Vertigo Bollesiana, Morse, Philada.; 126, Truncatella bilabiata, Pfr., Oak Lodge, Fla.; 127, Zonites cellarius, Müll., Philadelphia.

John H. Campbell, Philadelphia.—

151, Nassa fossata, Gould, San Diego, Cal.; 150, Helix Californiensis, Lea, Cal., with varieties, ramentosa, Gould: Bridgesii, Newc.: Nickliniana, Lea and Diabloensis, Cooper.

John Ford, Philadelphia.—

163, Mytilus edulis, Linn., Atlantic City, N. J.; 164, Modiola modiolus, Lam., Atlantic City, N. J.; 169, Crepidula fornicata, Linn., Providence, R. I.; 165, Unio nasutus, Say, Potomac R., (Washington); 166, Unio complanatus, Lea, same locality; 167, Unio Fisherianus, Lea, same locality; 168, Unio radiatus, Linn., Providence, R. I.

Total— 140 genera, 186 species, 196 trays.

GENERAL NOTES.

Ostrea gigas *Thunberg.*—In a collection of Japanese mollusks make by Mr. Frederick Stearns of Detroit, Mich., the writer found a specimen of this species measuring 17⅝ inches long, greatest breadth 3¾ inches, length of ligament area 3¾ inches. It is by far the largest recent oyster on record. Locality, Enoshima, Japan.—*H. A. Pilsbry.*

Tebennophorus Hemphilli.—Last Spring I found in Marion Co., Indiana, one specimen of Tebennophorus Hemphilli W. G. Binney, and revisited the place often since to find more, but succeeded only in taking a second (young) specimen.

So far the species has been known to exist only in North Carolina, and I deem it worth of notice that a new locality has been found.—*Dr. Fr. Stein, Indianapolis, Ind., in letter to ed.*

Species Determined.—From Mrs. M. Burton Williamson, University P. O., Cal. No. 1 (a) Cytherea lusoria Chemn., Japan; 1 (b) Cytherea meretrix Linn. Var. castanea, Lam., Japan. 2. Neritula neritea Linn., Crimea; 1. (small ones) Neritula Kamieschi Chemn. Crimea; 3. Bittum reticulatum, De Costa, Crimea; 4. Phasianella pulla, Linn., Crimea; 5. Mytilus minimus Poli, Crimea; 6, Rissoia violacea, Desm., Crimea.—*C. W. J.*

Scalpellum Stearnsii.—The writer found numerous specimens of an undescribed *Scalpellum* in a collection of Japanese mollusks and crustaceans made by Mr. Frederick Stearns of Detroit, Mich. The form differs from all recent species known, in the shape of the carinal latus, which projects in a long recurved hook below the carina. In this respect it is close to the *S. Pfeifferi* Weithofer, an Austrian miocene species. From this it is separated, however, by the form of the inframedian latus, which is about as broad as high in the *S. Stearnsii*, but is decidedly higher than broad in *S. Pfeifferi*. The sculpturing of the valves also differs from the form named. Illustrations will be given later.—*H. A. Pilsbry.*

Species Determined.—From M. Schepman, Rhoon, near Rotterdam, Holland. 1, 2, 5, *Cerithium ferrugineum* Say; 3, *C. ferrugineum var. versicolor* Ad.; 4, *C. eburneum* Brug; 6, 7, *C. atratum* Born.; 8, 9, 10, 11, 12, *C. minimum* Gmel. All from the Bahamas.—*H. A. P.*

Lucapinella, A new genus of Fissurellidæ.—This genus was defined in my key to the genera of Fissurellidinæ in the Manual of Conchology, part 47, but no type was mentioned, as the text relating to the genus will appear in the next part of that work. It includes the "*Clypidella*" or "*Fissurellidea*" *calliomarginata* Cpr. of California, and the following forms: *æqualis* Sowb., Panama; *limatula* Rve., West Indies; and *aculeata* Reeve. It differs from Fissurella and all its subgenera in having the central teeth of the radula of a square shape, about as broad as long; from *Fissurellidea*, *Papillæa*, *Lucapina*, *Megatebennus* in having the shell entirely free from the mantle which more or less envelopes it in those genera; the fleshy foot being likewise nude, not covered by the mantle. The margins of the shell are nearly level, as in *Lucapina*, and the orifice is about in the middle.—*H. A. Pilsbry.*

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DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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THE NAUTILUS.

VOL. IV. JANUARY, 1891. No. 9.

MOLLUSKS OF THE SAN FRANCISCO MARKETS.

BY PROF. JOSIAH KEEP, MILLS COLLEGE, CAL.

It would be interesting to know how many species of edible mollusks are to be found in the markets of the great cities of our country. I suspect that the number would be found to be surprisingly small, when we consider what a vast array of species fall into line and set themselves in array against the bewildered beginner, when he opens the simplest manual and attempts to gain familiarity with their names and natures. For one, I would be much interested to read in the "NAUTILUS" a series of articles upon the food mollusks which may be bought in the markets of our country; said articles to be written by various observers, each one reporting for his own locality.

The species of mollusks which the ordinary purchaser will find in the "fish markets" of San Francisco are only five in number, and of these, the amounts sold are very unequal. The first in importance as well as in social standing, so to speak, is the "Eastern Oyster," *Ostrea Virginica* Gmelin. This distinguished visitor to our coast is highly prized by all lovers of good things; far too highly prized, by the dealer, to admit of its forming any considerable portion of the food of the average conchologist. The price per dozen varies from twenty-five cents to half a dollar or more, according to size. The surprise of those who have been accustomed in the East to buy oysters by the quart, when they attempt to repeat their purchases here, is almost painful. A quart of oysters is something which few people in San Francisco ever call their own. Of course I do not

refer to the canned article, which may be bought for reasonable prices, but to the fresh and delicious bivalve, just "tonged" up from the waters of the bay.

But there is some reason for these high prices, for the dealer must first pay the fare of every one of these mollusks for a journey of three thousand miles. Of course they do not come in palace cars, but they must be hurried through on almost express time, because their intense desire for the sea will brook no delay. They detest the prairies, and care nothing for Rocky Mountain scenery; all they ask for is the ocean brine, and if they cannot have it speedily, they grieve their lives away on the road.

They are brought here in barrels, from Baltimore and other cities, when their shells are about the size of quarter or half dollars. Immediately after their arrival they are emptied upon rafts and towed to certain flats near the shores of the bay. When in the proper locality, the oyster-man takes up a shovelful of the young oysters and sows them into the water, as the farmer sows the seed-grain upon the furrows. As the raft is moved, he scatters more of the shelly seed and drives down poles to mark the bounderies of his new sown field. After lying at the bottom for a year or two, they are fished up upon the raft again. They have grown, some more than others, and are more or less aggregated into clusters. These clumps are broken up and the larger oysters are put by themselves. The smaller ones are thrown back, while the larger ones are transferred to an adjoining flat, or, if they are large enough, they are taken to the market. Usually, however, they live in our waters some three or four years before they are of sufficient size to be most profitable.

"But don't they multiply?" you may ask. Very little. They produce eggs in abundance, but few of them mature, and it has always been found necessary to bring young oysters from the East. Why the young fry do not survive I cannot say, but I believe it is because the ocean water here, even in summer, remains quite cold; too cold, probably, for the delicate infants whose ancestors have been accustomed to downright summer weather, during the "no-R" months. A few hardy ones do survive, however, and may in time produce a more robust race, but it is hinted that the dealers do not look upon them with great favor, as they find it more profitable to pay the freight—and keep up the prices.

The second mollusk on our list is also an oyster, but it is a very little one, the *Ostrea lurida* Cpr., or, as it is commonly called, the native or Oregon oyster. It lives in various places along the western coast, but is most abundant in the vicinity of Puget Sound. The shell is thin, and is seldom more than two inches in length. This oyster is very palatable, however, what there is of it, which is not much, and a sufficient number of them make an excellent stew. They are sold for about fifty cents a hundred, but the trade is limited.

The third species is a common creature, cheap enough for common people to use freely. Unlike the aristocratic oyster, it came to us unbidden; and more unlike still, it thrives and propagates and multiplies exceedingly. It is the *Mya arenaria* Linn., the real soft-shelled clam of Rhode Island, and "all along shore." Unknown in San Francisco Bay before 1874, it suddenly appeared, and in a few years the mud-flats around Oakland and Alameda became one of its most favorite breeding places, and the smooth surface at low tide resembles the top of a pepper box. This mollusk quickly grows to a large size and while lacking the delicious flavor of the oyster, it makes a very acceptable chowder. Great numbers of these clams are dug at low tide by the Chinese, and are retailed by them for a very moderate price. The *Mya* certainly holds the second place in respect to importance, and even disputes with the oyster for the first honors.

The puzzle of its sudden and recent advent can probably be solved by remembering what has been written about the oysters. It is likely that a few humble clams came in the oyster barrels as stowaways, unthought of and unknown; but lo, they made good speed to fill the bay with their descendants, while the infant oyster pines and dies for warmer water.

The "Hard-shelled Clam," *Tapes staminea* Conr., holds the fourth place among the merchantable mollusks of our coast. This is a variable species, some of the varieties growing to the size of a large hen's egg; but most of the specimens found in the markets are smaller. The shell is thick and strong, oval in form, and is ornamented with numerous fine ribs which radiate from the umbones. Its color is white or light gray, dashed with more or less stripes or chevrons of brownish purple. This mollusk loves the seacoast, and makes its burrows in gravelly or stony bottoms, instead of affecting muddy flats like the *Mya*. They are gathered somewhat sparingly,

most of the supply for this market coming from Tomales Bay, and are sold at moderate rates.

The edible mussel, *Mytilus edulis* Linn., is also to be found in the markets, though in small quantities, and apparently it is not in very great demand. Most of the specimens are of the small, smooth, dark purple variety, and average about two inches in length. They live in the bay, and attach themselves in great numbers to the piling of the wharves and similar stable objects to which they may fasten their strong byssus of horny threads. Along the coast outside of the bay, the larger mussel, *Mytulus Californianus* Conr., lives in great numbers, attached to the shaggy rocks which border the ocean, and sometimes grows to the length of eight or ten inches. This species is also edible, and the orange colored flesh of hot mussels, roasted in a fire of drift-wood, and seasoned with the sauce of sea-breeze hunger, has a delicious flavor which is not soon forgotten.

Occasionally you may find one or two other mollusks in the markets, but seldom. I have seen the large *Cardium corbis* Mart., and the Chinese eat the Squid, while the Frenchmen sometimes secures on the sly a big Helix; but these five species, two oysters, two clams and a mussel, are all that are commonly exposed for sale.

A NEW SPECIES OF LIMPET FROM JAPAN.

BY H. A. PILSBRY.

Patella (Helcioniscus) Stearnsii, N. Sp.

This is a form of Patella resembling outside the *P. exarata* Nutt., of the Sandwich Islands. It is the size of that species but usually somewhat more elevated. Color blackish-brown, with rays of white or greenish; dull and lusterless. Outside sculptured with about 50–56 strong, more or less nodose riblets, separated by deeply cut furrows. Interior bluish-white, but stained darker in places by the color of the outside, showing through; *the area inside the muscle-impression of a rich chestnut-brown color.* Around the margin are alternate blotches of blackish-brown and white, the blackish usually predominating; edge scalloped. The ribbing of the outside is not nearly so plainly indicated in the interior as in *P. exarata*, and in the space between the muscle-impression and the more vividly colored marginal border, *very fine, interrupted concentric wrinkles may*

be seen. This is a character not shown by *P. exarata.* The interior as a whole is somewhat iridescent.

Alt. 21, length 38, breadth 29 mill. Another specimen measures, alt. 18, length 41, breadth 31½ mill.

Specimens were procured by Mr. Frederick Stearns of Detroit, Michigan, on the coast of Japan, Kii Province.

It is possibly the form referred to by Dunker as *P. exarata.* From that species it may be distinguished by many characters, such as coloration, that species having black ribs on a whitish ground, and a milky-white interior, whilst *Stearnsii* has blackish rays, covering several ribs and their interstices, and a chestnut-brown area inside the muscle-attachment. The peculiar sculpture of the inside is also of itself diagnostic. Dunker (Index Moll. Maris Japonici, p. 157) also mentions *Patella mazatlanica* Gray in connection with his "*exarata.*" This shell is really a native of Chili, not Mazatlan! Dr. Ruschenberger collected specimens at Concepcion, which correspond *exactly* with Gray's figures (Beechey's Voy., Zool., pl. 39, fig. 12.) It is a more straightly conical form than *P. exarata*, differently colored outside, and having a small chestnut-brown area inside the muscle-impression; this area being much smaller than in *P. Stearnsii*, which also differs from it in the sculpture of the interior described above. Gray called his species "*mazatlandica.*"

Figures of *P. Stearnsii* will be given in Mr. Stearns' catalogue of the shells collected by him during his travels in Japan, now in press.

MOLLUSCA OF THE UNITED STATES.

BY JOHN H. CAMPBELL, PHILADELPHIA.

The project of establishing a great National Collection of United States Mollusca, through the co-operation of members of the American Association of Conchologists, has been received with such favor, that it is but a question of time when the collection will be one of the finest special exhibits in the world. The Philadelphia Academy of Natural Sciences, (through its Conchological Conservator) has offered facilities for the permanent exhibition and preservation of the collection, and already a goodly number of fine shells has been received and mounted.

With the preparation and mounting of the specimens, comes the question of correctly naming them; and herein is presented the most

perplexing confusion of nomenclature. Hundreds of synonyms encumber the literature on the subject, disputes as to specific and varietal rank and even whether or not some inoffending little shell belongs to this or that genus or family, confuse the student and almost compel him to throw up his studies in despair.

The very thought of these disputes almost deferred the writer from making a beginning, but as faint heart never won fair lady, we have plunged into the work, and with the help of our colleagues throughout America will do our best to successfully carry it on. And out of this determination has grown another idea, viz.: the settlement of the nomenclature of American shells, by means of the publication, from time to time, as the shells are received, of carefully compiled catalogues of the different species arranged into genera and families and the elimination of the hundreds of useless synonyms now to be met with in "shell literature."

As everything must have a beginning, we have concluded to start the work with this number of the NAUTILUS, and taking the first family that is already represented in the Collection by all the United States species,—the Haliotidæ—give a catalogue of the species, synonymy etc., connected with it.

As a sample of the method of procedure, we will state that out of diffidence concerning our own knowledge, we have consulted such specialists as Dr. J. G. Cooper, G. W. Lichtenthaler, H. A. Pilsbry, Mrs. M. Burton Williamson, Professor Josiah Keep, R. E. C. Stearns and Henry Hemphill and after comparing the information gathered from them, have passed judgment, and commited our own views to the kind consideration of the readers of the NAUTILUS, inviting their friendly criticism, and promising them that we are sufficiently humble in spirit to cheerfully correct any errors in our lists which may be pointed out to us.

With this long preamble we present the Haliotidae, and from time to time as the collection grows and it contains the material to make comparisons, we will continue to print other lists of the same character.

FAMILY HALIOTIDÆ.

The latest monograph of the family is contained in Pilsbry's continuation of Tryon's Manual of Conchology, Vol. XII, p. 72, etc. The family contains but one genus—Haliotis.

Genus HALIOTIS Linnæus.

1. Cracherodii Leach. Fallarones Ids. to San Diego, Cal.; Cape St. Lucas, Lower Cal.; fossil in Quaternary, San Pedro, Cal. —Zool. Misc. 131, 1815.

Haliotis glabra Deshayes; Haliotis glabra Schubert & Wagner; Haliotis Californiensis Swainson; Haliotis Cracherodii Leach, var. Californiensis Swainson; Haliotis interrupta Valenciennes.

2. Assimilis Dall. Monterey and San Diego, Cal., deep water only.—Proc. U. S. Nat. Mus., 1876, i, 46; Smithsonian Miscellaneous Col., vol. 19.

Haliotis (? var.) assimilis Dall.

3. Corrugata Gray. San Diego and Catalina Ids., Cal.

Wood's Index Test., Supplt., 1828.

Haliotis nodosa Philippi.

4. Fulgens Philippi. Monterey Bay, Cal. to La Paz and Cape St. Lucas, Lower Cal. Zeitschr. f. Mal., 1845, p. 150.

Haliotis splendens Reeve; Haliotis planilirata Reeve.

5. Gigantea Chemnitz. Monterey, Cal. to Kamtschatka; Japan. Conchylien Cab. X, p. 115, pl. 167, f. 1610, 1611; Gmelin, Syst. Nat. p. 3691.

Haliotis Kamtschatkana Jonas; Haliotis gigantea Chemnitz, var. Kamtschatkana (Jonas) Pilsbry.

6. Rufescens Swainson. Mendocino Co., to San Nicholas Id. Cal.; San Diego, Cal.; beach to 10 fathoms; fossil in Quaternary, San Pedro, and San Nicholas Id., Cal.

Catalogue Bligh Collection, Appendix p. 2, 1822.

? Haliotis ponderosa, C. B. Adams; Haliotis Californiana, Valenciennes.

List of Synonyms.

Californiana Val.=rufescens Swn.
Californiensis Swn.=Cracherodii Leach.
Discus Reeve=not found in the U. S.
Glabra Desh.=Cracherodii Leach.
Glabra Schub. & Wagner=Cracherodii Leach.
Kamtschatkana Jonas=gigantea Chemn.
Interrupta Val.=juv. Cracherodii Leach.
Nodosa Phil.=corrugata Gray.
Planilirata Reeve=juv. fulgens Phil.
Ponderosa C. B. Ad.=? rufescens Swn.

Pourtalesii Dall=not found in U. S.
Splendens Reeve=fulgens Phil.

Notes.

1. H. Pourtalesii Dall. Bull. Mus. Comp. Zool. xviii, 395, is said to have been dredged [one specimen] in 200 fathoms, near Florida Reefs, by Pourtales, in 1869, but as the specimen was destroyed in the great Chicago fire, and none has been found since, we may dismiss it from the list of United States species, especially as no other specimen or species of Haliotis is known to have been found on the East Coast of America.

2. It seems to us a pity that H. fulgens Phil. should be substituted for the well known and generally used name of H. splendens Reeve. The law of priority of description should give way in exceptional cases of merit, but as Mr. Pilsbry in Tryon's Manual has made the substitution, and some of the specialists to whom we have written agree with him, it is perhaps as well to accede to the change, so as to have the name of the shell settled.

3. A fine series of shells in the Academy collection, seems to prove that Haliotis Kamtschatkana Jonas passes imperceptibly into Haliotis gigantea Chemn. The home of the species is Japan, and it reaches its highest development there, extending northward around the Coast of Asia to the West Coast of America and reaching as far south as Monterey, Cal. getting smaller in proportion to its distance from Japan. We see no reason for making it a variety.

4. Mr. Henry Hemphill of San Diego, Cal. says of Haliotis assimilis Dall: "It has a certain aspect of its own. Its habits are different from any of the other forms, being a deep-water and not a littoral shell, while all the other Haliotis are found between tides. I have always considered it a hybrid between H. corrugata and H. splendens, on account of its having an intermediate aspect about it.

[Contributed.]

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

December 31, 1890.

Since last announcement the following new members have been enrolled:

124. T. H. Aldrich, Blocton, Ala. *Tertiary fossils of Atlantic Coast.*

125. Dr. Wm. H. DeCamp, Grand Rapids, Mich. *Michigan Mollusca.*

126. Wm. H. Weeks, Jr., Brooklyn, N. Y. *Bulimus* (genus).

127. Dr. Fred. Stein, Indianapolis, Ind.

128. Francisco E. Blanes, Key West, Fla.

129. Capt. W. J. Farrer, Orange, Va. *Land and F. W. Shells of Virginia.*

Mr. James H. Morrison has removed from Lexington, Va. to Luray Inn, Va.

We occasionally receive letters from members inquiring about exchanging shells. There is no obligation on the part of the members

to exchange shells. That is a matter which rests entirely with the members themselves. We would suggest, however, that members desiring to exchange specimens would announce the fact in the NAUTILUS, through the Secretary, and in that way they might add to their collections.

It is an obligation of membership to assist each other with information, where possible, and no member should hesitate to address another if he requires help in his studies. As far as possible, members desiring information upon any special point should address the members whose specialties will designate them as likely to be possessed of the requisite knowledge. A student of marine mollusca should not be asked to name Goniobases or Unionidae and vice versa. The entire range of Conchology both recent and fossil is now covered by members, and there should be no difficulty in gaining all the knowledge that can be acquired through correspondence. We have ever found the members kind and courteous, as well as patient, in answering queries and aiding us to settle disputed points. The more correspondence, the more beneficial will be the existence of the Association.

Donations to United States Collection.

The publishers of the NAUTILUS cannot give us the space to print itemized lists of all the shells received, as was done in the last two numbers, but we will continue to acknowledge from month to month, but in less extended form, the donations to the collection. The following additions to previous lists show the rapid progress of the collection.

G. W. Lichtenthaler, Bloomington, Ill.—51 species of West Coast Shells, including Triton (Priene) Oregonensis, Redf. Port Townsend, Wash.; Astralium undosum, Wood, Rincon Pt. Cal.; Sadidomus Nuttallii, Conrad, Alaska; Pecten hastatus, Sby. var. Hindsii, Cpr., Squimalt Bay, B. C.; Mures festivus, Hinds, False Bay, Cal.; Macoma secta, Conrad, Alaska; Nassa tegula, Reeve, San Diego, Cal.; Macoma inquinata, Desh., Alaska; Chama spinosa, Sby. and exogyra, Conrad; five species of Chitons; Acmaea persona, Esch., scabra, Nutt., patina, Esch. and pelta, Esch.; Solecurtus Californianus, Conrad, San Pedro Bay, Cal.; Pecten bella, Conrad, Pliocene, Santa Barbara, Cal.; and also several fine sections of shells, showing the interior structure.

C. Antoinette Shepard, New Britain, Conn.—Strophia Floridana, Dall, and Venus penita Conrad, Miocene Silex Beds, Tampa,

Fla.; a fine suite of Strombus bituberculatus, Lam., Key West, Fla. and seven other Florida marine species.

John Ford, Philadelphia, Pa.—a huge pair of Ostrea Virginica, Gmel., Staten Id., N. J.; Cardium magnum, Born, Key West, Fla.; Asaphis deflorata, Linn., Elbow Key, Fla.; and several others.

Chas. Le R. Wheeler, Cape May, N. J.—Very fine, large specimens of Fulgur carica, Gmel and canaliculata, Say, from Cape May; Cytherea convexa, Say, same locality; Natica duplicata, Say and heros, Say, same locality, and several others.

Joseph Willcox, Philadelphia, Pa.—A number of scarce and fossil species including Buccinopusus paralis, Conrad, Miocene, St. Mary's Md.; Venus tridacnoides, Lam, Miocene, York R., Va.; Cardium Dalli, Heilpr., Pliocene, Caloosahatchie, Fla.; Pecten Madisonius, Say, Miocene, Calvert Co., Md.; Calliostoma englyptum, A. Ad., S. W. Fla.

Albert Bailey, Chepachet, N. Y.—Over 20 species of land shells of Herkimer Co. N. Y., including Helix albolabris, Say, monodon, Rack., Sayii, Binn., exoleta, Binn., elevata, Say, Mitchelliana, Lea and dentifera, Binn.; Vitrina limpida, Gould; five species of Zonites and four of Succinea.

Dr. W. S. Strode, Bernadotte, Ill.—A box of Unionidae from Spoon R., Ill., including Union heros, Say (very large); ligamentinus, Lam.; laevisisimus, Lea; tuberculatus, Barnes; trigonus, Lea and rectus, Lam. Also fine specimens of Anodonta suborbiculata, Say and Margaritana complanata, Lea.

Wm. J. McGinty, Philadelphia, Pa.—Unio orbiculatus, Hildr., Unio cylindricus, Say; Unio crassidens, Lam.; and Cooperianus, all from the Ohio R.

Wm. J. Raymond, Oakland, Cal.—Ten species of West Coast Shells, including Olivella boetica, Cooper, San Diego, Cal.; Mopalia Hindsii, Gray, San Francisco, Cal.; Monoceros engonatum, Conrad, Bolinas, Cal. and Purpura saxicola, Val. San Francisco, Cal.

Uselma C. Smith, Philadelphia, Pa.—Conus Californicus, Hinds, San Diego, Cal.; Nassa trivittata, Say and obsoleta, Say, Atlantic City, N. J.; Siliqua costata, Say, Avalon, N. J. and others,—all fine suites.

Mrs. M. Burton Williamson, University, Cal.—Very interesting suites of Haliotis Cracherodii, Leach and Lottia gigantea, Gray, San Pedro Bay, Cal.

Philip Nell, Philadelphia, Pa.—Physa ancillaria, Say, and heterostropia, Say; Succinea obliqua, Say, and Helix hirsuta, Say—all from Philadelphia.

Geo. W. Dean, Kent, O.—Several species of the smaller species of land shells from Kent, Ohio, including Zonites milium, Morse; multidentatus, Binn and exiguus, Stimp.; Helix labyrinthica, Say, and Pupa milium, Gould. It is just as important to have the minute species as the larger ones and we are glad to see some of the members paying attention to them.

John H. Campbell, Philadelphia, Pa.—Natica Lewisii, Gld., Puget Sd. Wash.; Columbella carinata, Hinds. with its varieties, Hindsii, gausipata, Californica, Gouldii and others.

Dr. V. Sterki, New Philadelphia, O.—Several species of Pupa and Vertigo including Pupa Holzingeri Sterki and Pupa procera Gould.

Total, 115 genera, 242 species, 252 trays.

GENERAL NOTES.

Specimens of Succinea and Ancylus are desired by Prof. B. Shimek, 219 Bloomington St., Iowa City, Iowa. A large list of land, fresh-water and marine shells are offered in exchange.

Australian Limax. We are informed by Mr. Charles Hedley of the Queensland Museum, that *Limax Queenslandicus* Hedley is identified by Dr. Simroth as *Agriolimax laevis* Müller; which, it seems, has established itself in Australia.—*H. A. P.*

The attention of our readers is called to the advertisement of Mr. Hugh Fulton, in this number of the Nautilus. Mr. Fulton was for over fourteen years, assistant to G. B. Sowerby, esq., F. L. S., of London, before commencing business for himself. Speaking from our own experience, we can as cordially recommend him to conchologists desiring foreign shells, as we do Henry Hemphill to those wishing to purchase American mollusks.

PUBLICATIONS RECEIVED.

The Loess and its Fossils, by Prof. B. Shimek. (from Bull. Lab. N. H. State Univ. Iowa, 1890.) This well-considered paper contains observations on the fossils of the Loess in western Iowa and eastern Nebraska. *Zonites Shimekii* has been found in Otoe Co., Neb. and Tremont Co., Iowa, localities far to the west of the original find, Iowa City, Iowa. Prof. Shimek's conclusions respect-

ing the physical conditions of the time of the Loess deposit strongly recommend themselves to us. Not much evidence of colder climate than now prevails over the same district can be derived from the fossils, which differ but slightly, when at all, from recent specimens *from the same locality.* Mr. Shimek concludes that—

The climate was comparatively uniform during the entire period, if we may judge from the fossils, for the same forms are often found from the very base, just over the drift, to the uppermost portions of deposits one hundred feet or more in thickness. No difference is noticeable between specimens of the same species from the lowermost and the uppermost portions of the deposits,—a fact which warrants us in concluding that climatic changes during the deposition of the Lœss could not have been very great. The fact may here again be emphasized that while a depauperation is noticeable in some of the species, it is far from sufficient to indicate a temperature such as would be necessary to retain lakes and streams within shores of ice during the summer, and that consequently the Lœss was not deposited during a glacial climate, but at a time when the temperature had moderated sufficiently to enable many land-shells, now restricted to or abundant in middle latitudes, to flourish in considerable numbers.

The great predominance of strictly terrestrial species of molluscs in the Lœss indicate that during its deposition large areas of land-surface were exposed, at least during the greater part of the summer, upon which these molluscs lived and multiplied under conditions which exist now in the habitats of their modern representatives.

For the belief that the fossils as now found are not far removed from the localities in which they lived and developed, a number of valid reasons exist, the most striking of which are the following:

1. *Their usually perfect preservation.* Such delicate shells as many of those under consideration could not be transported far by turbulent streams without being broken.

2. *Their distribution, both vertically and horizontally.* In many exposures of the Lœss the species which to-day have the habit of remaining in considerable numbers in very restricted localities, as *Helicina occulta, Patula strigosa cooperi, Mesodon multilineata*, the *Limnææ*, etc., are likewise similarly restricted in their horizontal distribution to very narrow "pockets," though the same species may often be traced vertically for many feet, as though the shells had gradually accumulated through many generations. Again other species are more generally and more uniformly distributed in a manner which recalls their present habits, and which indicates that they have not drifted into the places in which we find them to-day,—at least not sufficiently far to disturb the arrangement with reference to each other, which we may observe in the living specimens.

The writer's conception of the climate and of the origin of the Lœss, based largely upon a careful and extended study of its fossils, may be briefly summarized as follows:

I. The summers during the formation of this deposit were comparatively warm, and the glaciers had already retreated far to the north when the deposition commenced.

II. During at least a part of the summers a large portion of the area now covered by the Lœss was elevated above the surface of water, as indicated by the presence of the predominating land shells.

III. These shells, too, indicate that the surface was not entirely unlike our present prairies in Iowa and Nebraska, though perhaps more moist, and more nearly level.

VI. The presence of shells of the genera *Limnæa, Physa, Planorbis*, and *Pisidium*, which are principally pond species, indicates that over this prairie surface were scattered numerous ponds and that it was traversed by quiet, sluggish streams.

V. The distribution of the shells as well as the homogeneity and fineness of the material forming the deposit indicate that the deposition was unaccompanied by violent disturbances, but that it took place quietly, and very slowly during a long period.

VI. The deposit itself was probably partly formed from sediment carried over portions of the surface by quiet overflows of the sluggish streams which had not yet deeply cut their channels. The numerous ponds, however, fed by the drainage in their immediate vicinity, were also receiving with this the finer material gathered from the glacial drift surrounding them. This material being like that gathered by the streams, would form similar deposits, each pond or swamp forming in this way a bed of Lœss. The changes in the level of water in the ponds would produce a change in the extent of the muddy flats along their shores, thus facilitating the distribution of the terrestrial shells. These ponds and streams, by shifting about through the combined influence, of floods and drouths, extended the distribution of the sediment, and subsequent erosion completed the work necessary to produce the present topography.

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DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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ASSOCIATE EDITOR:
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THE NAUTILUS.

VOL. IV. FEBRUARY, 1891. No. 10.

FORMS OF AMERICAN CARYCHIUM.

BY H. A. PILSBRY.

The forms of *Carychium* found in America have all been referred to the one species *exiguum* by Mr. Binney. In examining a series collected by Mr. Geo. W. Dean of Kent, Ohio, referred to me by my friend John Ford, I found a certain form which Mr. Dean considered distinct. It is far more slender than ordinary *exiguum*. The amount of difference is considerable, and only the extreme minuteness of the shells has prevented conchologists generally from recognizing it. One conchologist however, *has* done so:—Henry Carey Lea, Apostle of microscopic shells! The forms may be distinguished thus:

C. exiguum Say, (typical). Rather cylindrical, the next to the last whorl nearly equaling the last in diameter; mouth one-third (or more) the length of shell; outer lip thickened, expanded, sometimes obsoletely thickened, scarcely toothed, in the middle. This is by far the most abundant and generally distributed form.

C. exiguum var. exile H. C. Lea. Much slenderer than the preceding, longer, more distinctly striated; mouth smaller, less than one-third the total length of shell; outer lip thickened, often distinctly toothed in the middle. Specimens described are from Kent, Ohio.

C. exiguum var. occidentalis Pilsbry. Somewhat larger than typical exiguum, *distinctly conical*, not at all cylindrical, acute; outer lip expanded, thin, not at all toothed. It is from Portland, Oregon.

The writer proposes to figure the forms later. I may say that Mr. Ford concurs with me in the arrangement of varieties here offered.

The entire series of American *Carychium* is closely allied to *C. minimum* of Europe, and doubtless sprang from the same circumpolar stock.

NOTES ON Mr. HEMPHILL'S CATALOGUE.

BY CHAS. T. SIMPSON.

In a late number of The Nautilus the editor[1] called attention to the catalogue of shells recently issued by Mr. Henry Hemphill, (in which he has made a considerable reduction in the number of species) and asked for the opinions of students throughout the country. As Mr. Hemphill is known to all to be a most careful collector, and a close observer of the facts connected with the lives and surroundings of Mollusks, such a reduction by him of the number of our hitherto acknowledged species is, as has been remarked, rather startling, and is, on account of the prominence of its author entitled to at least careful consideration.

It seems to me that the time is near at hand for quite a change in our ideas concerning the classification of the forms of organic life and their variations. The old idea which has so long prevailed, that species were formed by an act of creation, fixed and unchangeable, as coins are stamped out at a mint; that genera and higher groups have an invariable limit, is fast becoming obsolete, and we are being daily forced by stubborn facts to learn that variation is the rule and fixity the rare exception, that the limits of species and the higher groups of forms are very often vague, or so absolutely uncertain as to be impossible to define. By far the greater number of scientists believe in the theory of evolution in some form or other, and hold that all the existing animals and plants are but the direct descendants of other and extinct species, that the infinite variation which is found is caused largely by environment and other circumstances connected with the life of the organism. In the United States we should expect to find an excellent field for such variation.

[1] The article on Mr. Hemphill's Catalogue to which allusion is made was not written by the Editor. It was contributed by the officers of the American Association of Conchologists.—Ed.

Its continental area, its diversity of climate from the boreal regions of the British possessions to the very borderland of the tropics, its wide streches of plains, varying from forest covered to entirely naked, the difference in the height of its mountains, its areas of almost perpetual humidity which shade out into desert regions, would give just the conditions necessary for the wide distribution of species, and for great and gradual variation. Such wide distribution and variation we find with most of our forms of mollusks.

Various methods have been proposed by which these lesser variations may be designated. Some have classed them as varieties of species, giving to each a varietal name, others have resorted to lettering or numbering, while the ornithologists of America class them as sub-species. The New School of Conchologists of Europe seeks a way out of the difficulty by applying specific names to a great many of the minor variations, and generic names to small and ill-defined groups of species. Unfortunately for such systems of nomenclature, variation does not always occur in a lineal direction, or in other words, from one genus or species directly to another, but often seems to be broken up so that certain forms or groups combine the characters of several other forms or groups, and appear very much like hybrids.

In the wonderful series of *Patula*, beginning with elevated shells with rounded whorls and strong radiating ribs known as *Helix Idahoensis* which varies gradually through the less elevated and smoother forms of *Cooperi* and *strigosa*, to *Hemphilli* and *Haydeni* which are lenticular and sharply keeled with strong revolving sculpture, we find such irregular varieties or natural hybrids, which hardly admit of naming. Elevated forms are not rare, having radiating sculpture and sharp keels, in others of the same general form the ridges are revolving, thus partaking more or less of the characters of *Idahoensis* and *Hemphilli;* and greatly flattened shells are met with, without keels and with more or less decussated or even radiating sculpture, in fact in the 1500 or more specimens of this protean form in the collection of the National Museum, one can observe this crossing of characters in almost every direction. To attempt to designate these hybrids, if such they are, by name is simply an impossibility. The argument is put forth by many that it is better to give any form a name than to have to describe it every time, it is mentioned, but to carry it out one could apply fifty names to the variations of *Melongena corona* or *Cyrena Floridana*, or twice that

number to the color varieties of *Oliva inflata*, *Helix picta* or *varians*, and to designate all the forms of the above mentioned group of *Patula* would seriously tax the brain of the most ardent devotee of New School doctrines.

Another way out of the difficulty is by throwing together under one name those things which cannot be separated, as Fischer has done to some extent with genera, and Tryon with species. The consolidation by Dr. Dall of *Helix microdonta*, *Febigeri*, *septemvolva*, *Carpenteriana* and *cereolus*, under the latter and older name; the union of the group of *Patulas* I have mentioned under a single appellation, and Mr. Pilsbry's somewhat startling announcement putting such genera as *Mesodon*, *Polygyra*, *Triodopsis* and *Stenotrema* into one group, are examples which I believed are approved by the good sense of a majority of American Conchologists. Mr. Hemphill has simply gone a little farther in the direction which these gentlemen have moved, and I believed there is a wide field here in the United States for further work in the same way. I do not believe in naming or holding on to names for those things which have neither beginning nor end.

EDIBLE MOLLUSKS OF MAINE.

BY HENRY WINCKLEY.

As a supplement to the article by Prof. Keep in the January NAUTILUS, and in accordance with his suggestion, Maine responds to California with the following list of Mollusks found in the markets.

Ostræa virginica (Gmel). As in all Eastern States this is by far the most popular food mollusk; they are obtained from the South, *i. e.* from Providence to Norfolk, Va. There is a small bed of living oysters in the Sheepscote River, some fifteen miles from the sea, and occasionally a few are obtained and eaten by some energetic individual; they are not numerous and hence do not find their way to the markets.

Mya arenaria Linn., is largely used and abounds everywhere along the coast. It is an inexpensive food and used by all classes. Large quantities are canned.

Pecten tenuicostatus Mighels & Adams. This last species is quite an important article of food in the winter season, and probably is not found in any market to the south of this state. It has as a rival the popular *Pecten irradians* imported from Long Island Sound, but is common in our markets.

Mactra solidissima Chemnitz. The presence of this species in the market is somewhat dependent upon the storms. Some weather brings them out and at such times they can be bought. They occupy a place in the mollusks like that of game birds among the feathered population, very popular and when obtained in small quantities, as is frequently the case, it gets no further than the table of the finder, who rejoices over his good work. It is much prized.

Venus mercenaria Linn. Occurs at one spot on the coast, I have not seen it in the markets, whether it is occasionally used or not I am not sure.

In addition to the above, I do not know of any that can be reported as commonly used. Others are found; the edible muscle abounds, but is not sold. *Solen ensis* sometimes makes a meal for a lucky man who chances to obtain a sufficient quantity, but these are chances rather than regular market food.

LIST OF MOLLUSCA OF GLOUCESTER CO., N. J.

BY WM. J. FOX.

The following list includes all the species of Mollusca collected in Gloucester Co., N. J. from June to September, 1890. It is without doubt far from being complete, as my specialty being Insects, I could devote but little time to collecting shells. Southern New Jersey being but little frequented and unprofitable to shell collectors, being for the most part sandy soil, this list may prove of some interest to the readers of the NAUTILUS. For the determination of these species, I am indebted to Mr. H. A. Pilsbry.

LIMACIDÆ.

Limax sp.

Zonites ligerus Say, var. *Stonei* Pilsbry.

Zonites arboreus Say.

Zonites radiatulus Alder.

Zonites indentatus Say.

Zonites minusculus Binn.
Zonites suppressus Say.

HELICIDÆ.
Patula striatella Anth.
Patula lineata Say.
Punctum pygmaeum minutissimum Lea.
Helix thyroides Say.
Helix albolabris Say.

PUPIDÆ.
Pupa contracta Say.
Vertigo sp. (juv.)

SUCCINEIDÆ.
Succinea avara Say.
Succinea obliqua Say.
Succinea ovalis Gould.

LIMNAEIDÆ.
Limnæa catascopium Say.
Limnæa humilis Say.
Planorbis trivolvus Say.
Planorbis bicarinatus Say.
Planorbis parvus Say.
Planorbula armigera Say.
Ancylus rivularis Say.

PHYSIDÆ.
Physa ancillaria Say.

AURICULIDÆ.
Carychium exiguum Say.

VIVIPARIDÆ.
Campeloma decisum Say.
Lioplax subcarinata Say.

AMNICOLIDÆ.
Amnicola limosa Say.
Amnicola grana Say.
Pomatiopsis lapidaria Say.
Somatogyrus altilis Lea.

VALVATIDÆ.
Valvata bicarinata Lea.

STREPOMATIDÆ.

Goniobasis virginica Gmel.

CORBICULIDÆ.

Sphaerium transversum Say.
Sphaerium striatinum Lam.
Pisidium virginicum Gmel.

UNIONIDÆ.

Unio complanatus Sol.
Unio cariosus Say.
Unio nasutus Say.
Anodonta Tryonii Lea.

A CATALOGUE OF CONCHOLOGICAL ABBREVIATIONS.

BY F. C. BAKER, ROCHESTER, N. Y.

G.

Garr. or Grt.	Garrett, Andrew.	American.
Gld	Gould, Dr. A. A.	American.
Gmel.	Gmelin, J. F.	German.
Greg.	Gregorio, Antonio de.	Italian.
Gundl.	Gundlach, J.	Cuban.
Guild.	Guilding, L.	English.
Gut.	Gutierrez.	Cuban.

H.

H. & J.	Hombron & Jacquinot.	French.
Hald.	Haldeman, S. S.	American.
Hanl.	Hanley, Sylvanius.	English.
Hartm.	Hartmann, D. W.	Swiss.
Heyn.	Heynemann, D. F.	German.
Hds.	Hinds, R. B.	English.
Hombr.	Hombron, M.	French.
Humph.	Humphreys, J. D.	English.
Hutt.	Hutton, F. W. English.	New Zealand.

J.

Jacq.	Jacquinot, H.	French.
Jeffr.	Jeffreys, J. G.	English.
Jouss.	Jousseaume, Dr.	French.

K.

Kien.	Kiener, L. C.	French.
Kregl.	Kreglinger, G.	German.
Küst.	Küster, H. C.	German.

L.

Lam.	Lamarck, M. le Chev.	French.
Lindstr.	Lindstrom, G.	Danish.
Linn.	Linné (Linnæus,) Carl von.	Swedish.

M.

Mab.	Mabille, M. P.	French.
Mart.	Martyn, Thos.	English.
Midd.	Middendorf, A. T. von.	Russian.
Mich.	Michaud, A. L. G.	French.
Migh.	Mighels, J. W.	American.
Mke.	Menke, C. T.	German.
Mtg. or Mont.	Montagu, G.	English.
Montf.	Montfort, Denys de.	French.
Montr.	Montrouzier, M.	French.
Monts.	Monterosato, M. di.	Italian.
Mouss.	Mousson, A.	French.
Moq.-Tand.	Moquin-Tandon, A.	French.
Müll.	Müller, O. F.	German.

N.

Newc.	Newcomb, Dr. Wesley.	American.
Nutt.	Nuttall, Thomas.	English.

P.

Payr.	Payraudeau, P. C.	French.
Parr.	Parreyss, Dr.	German.
Pfr.	Pfeiffer, Dr. Louis.	German.
Phil.	Philippi, Dr. R. A.	German.
Pse.	Pease, W. Harper.	American.

Q.

Q. & G.	Quoy & Gaimard.	French.

R.

Raf.	Rafinesque, C. S.	French–American.
Redf.	Redfield, John H.	American.
Rossm.	Rossmässler, E. A.	German.
Rve.	Reeve, Lovell.	English.

S.

Schum.	Schumacher, C. J.	German.
Sowb. or Sby.	Sowerby, G. B.	English.
Shuttl.	Shuttleworth, R. J.	German.
Spengl.	Spengler, L.	German.
Stimp.	Stimpson, W.	American.

T.

Theob.	Theobald, W. Jr.	English.
Trosch.	Troschel, F. H.	German.

V.

Val.	Valenciennes, M. A.	French.

W.

Wein.	Weinkauff, H. C.	German.
Woll.	Wollaston, T. V.	English.
W. G. B.	Binney, W. G.	American.

[Contributed.]

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

January 21, 1891.

Since last announcement the following new members have been enrolled:—

130. John Brady, Aledo, Ill. *Unionidæ.*

131. John H. Britts, Clinton, Mo. *Carboniferous Palaeozoic Mollusca.*

132. Delos Arnold, Pasadena, Cal.

133. A. W. Hanham, Brantford, Ont. *Canadian Land and Fresh Water Mollusca.*

134. Mrs. J. M. Gaige, Detroit, Mich. *Muricidæ.*

135. Mrs. Amos O. Osborne, Waterville, N. Y. *Land and Fresh Water Shells.*

136. Mrs. Mary P. Olney, Spokane Falls, Wash.

137. Berlin H. Wright, De Leon Springs, Fla. *Unionidæ of Gulf States.*

138. Anna Goodsell, Poughkeepsie, N. Y.

The following members have chosen subjects:—

Dr. Fred. Stein, Indianapolis, Ind. *Air-breathing Mollusks of U. S. and Europe.*

Francisco E. Blanes, Key West, Fla. *Marine Mollusca of Florida and Cuba.*

Ida M. Shepard, Long Beach, Cal., has changed her subject from *West Coast Shells* to *West Coast Marine Shells and Helicidæ.*

G. W. Lichtenthaler is now upon a visit to California, where he will doubtless add to his already extensive knowledge of West Coast Shells.

Joseph Willcox and Uselma C. Smith, of Philadelphia, are travelling in Florida at the present time.

C. A. Hargrave, Danville, Ind., has accepted the editorship of the Department of Conchology in "The Observer," published in that city. He is a good conchologist, and will no doubt make his department a success.

Henry A. Ward, Rochester, N. Y., is about to pay a visit to Cuba and Jamaica on a natural history quest.

Ida M. Shepard, Long Beach, Cal., will shortly start upon a two months' collecting tour in the Gulf of California.

Mrs. S. H. Young has changed her residence from Long Beach, Cal., to Butler, Pa.

Rev. H. W. Winkley, Saco, Me., writes: "I am delighted with my experience in the Association. I have exchanged with several, received letters, etc. They all seem to have the same interest in Conchology that I have."

Chas. Schuchert, Albany, N. Y., is preparing a "Bibliographical Catalogue of American Fossil Brachiopoda." It is a much-needed work, and is in thoroughly competent hands.

Members desiring to have any Cypraeas named, will please mail them to the President, who will take pleasure in naming and promptly returning them. Of course no charge will be made.

The pleasure of assisting members will be a sufficient recompense to him.

Donations to the United States Collection.

The collection is progressing wonderfully, and it is a source of much gratification to note the general interest evinced by members, and the receipt of such fine specimens as are sent. Some of the specimens and suites sent are superb. Since last acknowledgment, the following have been received, mounted, and placed in the cases:—

O. A. Crandall, Sedalia, Mo.—More than 20 species of Land Shells from Missouri, Arkansas and Texas, including Goniobasis sordida, Lea; Saffordi, Lea, and Crandalli, Pilsbry; Helix inflecta, Leaii, Dorfeuillana, var. Sampsoni, Weth., appressa, elevata and Roemeri; Pupa fallax, Say, and armifera, Say; and Sphaerium striatinum, Lam.

Rev. H. W. Winkley, Saco, Me.—12 species of New England Shells, including Aplexa hypnorum, Linn.; Segmentina armigera, Say; Cryptodon Gouldii, Phil.; Macoma Baltica, Linn.; Littorinella minuta, Totten; Gemma gemma, Totten, and Helix pulchella, Müll.

John Ford, Philadelphia, Pa.—Nerita peloronta, Linn, Key West, Fla., and a fine suite of Oliva litterata, Lam., from S. W. Florida.

J. A. Singley, Giddings, Tex.—Over 30 species of Texas Land Shells, and 12 species of Texas Tertiary Fossils, including fine suites of Bulimulus alternatus, Say, and Holospira Goldfussi, Menke; Helix Texasiana, leporina, Berlandieriana, Copei, labyrinthica, Henriettae, Cragini, Mooreana, and thyroides; Zonites Singleyanus, minusculus and friabilis; Helicina tropica, Jan.; Goniobasis Comalensis, Pilsbry; Physa Sayii, Forsheyi and Halei; Amnicola peracuta, Pilsbry and Walker; Pisidium compressum, Prime and Sphaerium subtransversum, Prime.

Chas. LeR. Wheeler, Cape May, N. Y.—Additional examples of Fulgur canaliculata and carica (magnificent specimens); Natica heros, Say; Dosinia discus, Reeve, Swansboro, N. C.; Pholas truncata and Zirphaea crispata, Linn., Cape May, N. J.

E. H. Harn, Blairsville, Pa.—Helix profunda, Say, and Pennsylvanica, Green.

H. Moores, Columbus, O.—Helix multilineata profunda, monodon, exoleta, fallax and albolabris from Columbus, Ohio; two species of Pomatiopsis and two of Amnicola.

E. W. Roper, Revere, Mass.—A very valuable series of Pisidium and Sphaerium, ranging from the youngest to the oldest forms, including Sphaerium secure, rhomboideum, and partumeium; Pisidium Idahoense (his new species), variabile, compressum and abditum. Also a fine series of Purpura lapillus, Linn.

Chas. W. Johnson, Philadelphia, Pa.—Fine suite of Melongena corona, Gmel., from S. W. Florida; Succinea effusa, Shuttl. Ocklawaha River, Fla., and Helix pustula, Fér., St. Augustine, Fla.

Dr. V. Sterki, New Philadelphia, O.—Pupa rupicola, Say, and Vertigo rugosula, var. ovulum, Sterki, both from Volusia County, Fla. Also an interesting lot of Unios from the Tuscarawas River, Ohio, including Unio luteolus, Lam.; multiradiatus, Lea; phaseolus, Hildr; lens, Lea; pustulosus, Lea; subrotundus, Lea; pyramidatus, Lea; coccineus, Lea; rubiginosus, Lea; irroratus, Lea; triangularis, Barnes, and undulatus, Barnes. Also 3 species of Margaritana (Alasmodonta), and 4 species of Anodonta.

Total, 138 genera, 352 species, 402 trays.

GENERAL NOTES.

Ariolimary Columbianus Var. straminea. Animal when extended about six inches long, with the marking of A. Columbianus, of a uniform light straw color, a shade lighter beneath the foot. Habitat, Santa Cruz Island, California.—*Henry Hemphill.*

Notes on certain species of Cepolis. In the Manual of Conchology, 2d. series, vol. V, the writer described as new, under the name *Helix pimesoma*, a Haitian shell which proves to be the same as the unfigured *H. trizonaloides* A. D. Brown, as I have satisfied myself by finding Brown's types with his original label, in the collection of Mr. John H. Campbell, Philadelphia. I may also note here that *Helix squamosa* Fér. placed in *Cepolis* in the *Manual*, is really a species of *Jeanneretia*,—a section having apparently no especial affinity to *Cepolis*.—*H. A. Pilsbry.*

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR:
H. A. Pilsbry, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

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C. W. Johnson, Acting Curator Wagner Institute of Science.

Vol. IV. MARCH, 1891. No. 11.

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THE NAUTILUS.

VOL. IV. MARCH, 1891. No. 11.

NOTES ON THE SCULPTURE OF AMERICAN LIMNÆAS, ETC.

BY ROBT. E. C. STEARNS.

In several instances parties who have sent specimens of American Limnæas to the U. S. National Museum for identification, have called attention to the sculpture of the specimens, as if this character was peculiar to the examples sent by them, and not previously observed; hence the following notes which may be of some use in connection with the study of pond-snails, by beginners in this class of molluscan forms.

The extensive geographical series, and numerous examples in the National Collection show the sculpture characters to be as follows, and that all of the so-called species, of which without doubt there are at least "twice too many," exhibit in a greater or less degree when a large geographical series is brought together, with an ample representation of individuals, the same aspects of sculpture variation.

FIRST. The longitudinal incremental or growth lines are often conspicuously developed in forms that generally are smooth or with scarcely discernible growth lines, and occasionally individuals are met with in which there is apparently a serial or alternating arrangement of bands or zones of fine and coarse growth lines, suggestive of a positive longitudinal sculpture, which we may suppose to be due to a more vigorous growth at one season than another. Again the larger whorls often exhibit a tumid or bulging elevation or prominence which is rarely or seldom regular, usually irregular in occurrence, and not infrequently so conspicuous as to produce absolute

distortion, as if a season of moderate food supply had been followed by an aldermanic dinner or two, resulting in sudden and phenomenal growth followed by a penitential period of more temperate eating.

These bulgings as before stated, seldom if ever exhibit any regularity of occurrence in the *Limnæas;* they often do, however, in the nearly related pond snails *Planorbis* and *Physa* as may be seen not infrequently in *Planorbis glabratus* wherein they seem to occur in somewhat orderly sequence. In the beautiful little *Physa* (*Costatella*) *costata* described by my venerable friend Dr. Newcomb, a form which inhabits Clear Lake, California—these bulgings are numerous and regular and are arranged nearly equidistant and give a postively *sculptured aspect* to the shell, in distinction from the suggestion of *pathologic eccentricity* like the bulgings of the *Limnæas* and many of the *Planorbis.*

The above variation in strength or prominence of growth or incremental lines, as they are usually called, is also common to many of the *Planorbes*, notably in *P. corpulentus* Say, from the West coast, and is also frequently exhibited in examples of the curious and interesting genus *Carinifex* another West coast form from Eagle Lake, California and elsewhere, and in the equally curious little shells of the genus *Pompholyx*; that enterprising and intelligent collector Henry Hemphill detected a pretty costate variety at the Dalles of the Columbia River, wherein the ribs are quite evenly placed and suggestive of frequent varicеal thickening as in some of the *Strophias.*

Many of the land shells of North America, as well as exotic species, exhibit varying aspects or facies of incremental sculpture, and many who read this will at once call to mind the difference, in this respect, of examples of *Mesodon* of the same species from different localities, also of *Patula alternata*, and the remarkable sculptural diversity of the forms now included with *Patula strigosa* and its synonyms. There are other groups of the *Helicidæ* which might be included, but these are sufficient for the purposes of illustration and among the *Bulimulidæ* we have no lack of instances, and the group *Strophia* of the *Pupidæ*, which has led Mr. Maynard into a sort of conchological quick-sand or "slough of despond," furnishes a further appropriate illustration.

Second. Inclusive of the first or above class of variation, we have the dinted or malleated aspect of sculpture, as if the shell had received a succession of light blows from a small hammer, blows

carefully given with sufficient force to dint the surface without breaking the substance of the shell. These dints are sometimes quite regular in arrangement and frequently have the aspect of zones following the basal and previous whorl transversely and parallel to the sutural line, like so many flat bands.

This form of sculpture is also met with not only in related groups like the *Physas*, often conspicuously shown in the form to which the late Dr. Lea gave the name of *P. Carltoni* as well as in other species of the same genus; frequently in *Planorbis* and *Carinifex* as well as in the river-snails *Ampullaria* and in the *Bulimi* among the land shells.

Third. Another and not infrequent aspect of sculpture is exhibited by several species, and consists of fine close set incremental lines crossed by transverse, somewhat waved and slightly incised grooves; the same character of sculpture is not infrequent in many terrestrial pulmonates. The Mexican *Glandinas*, for instance, furnish in several species, beautiful examples of this delicate tooling of the surface, to use a familiar mechanical term.

Mr. Dall recently collected several specimens of *Limnæa palustris* in the irrigation ditches near the Hot Springs in Honey Lake Valley, Lassen Co., California, (within the area of the extinct tertiary Lake Lahontan), which exhibit this form of sculpture markings. It is often if not generally present in the following species:

Limnæa lepida Gould, *Limnæa ampla* Mighels, *Limnæa Sumassi* Baird; and less frequently so far as I have observed, in *Limnæa columella* Say, *L. caperata* Say, and *L. lanceata* Gould. Doubtless many others of the numerous alleged species of this genus, occasionally exhibit this character of sculpture, which is seen in examples of all of those I have named even from widely separated areas.

It should not, however, be inferred that sculpture variation has any special or direct relation or connection with geographical distribution; that it has indirectly, in the *Limnæas* and the class of Mollusks to which said group belongs, there is no doubt, for it will at once come to the mind of any one familiar with the pond snails of all countries, that those inhabiting semitropical and tropical areas are much more constant or uniform in size, shape and sculpture than their fellows of the same kin from northern or colder latitudes, and the texture of the former is much finer and smoother on the whole, or all in all, than the forms that live in the cooler regions of the north. The influences that appear to induce, or cause variation

are environmental rather than geographical; and following in the general line or trend of this paper may be presented on another occasion.

NOTE ON GONIOBASIS CATENARIA SAY.

BY H. A. PILSBRY.

Having occasion recently to name some Florida *Goniobases*, the writer examined thoroughly the species described from that State. The characteristic type is *G. catenaria* Say. It is a turrited shell, blackish-brown or olive-brown, having numerous small folds extending from the suture to the angular periphery, crossed by two or three spiral threads, which form beads where they cross the folds; the periphery is more or less keeled and tuberculate; below it are a variable number (4–7) of spiral raised threads. The apex is eroded.

The sculpture is sometimes nearly obsolete, as in a blackish form collected in Marion Co. by Mr. G. W. Webster, and also sent me by Mr. Berlin H. Wright; or it may be very sharp and clear-cut, as in a beautiful form from Alexander Spring Co. The following synonymy I regard as unquestionably established:

G. catenaria Say, 1822. *G. Etowahensis* Lea, 1861.
G. sublirata Conr., 1850. *G. papillosa* Anth., 1861
G. Floridensis Rve., 1860. *G. Downieana* Lea, 1862.

Of the names given below, I have seen neither *G. Bentoniensis* or *G. Couperii*, but they seem to have very slight differential characters. *G. Hallenbecki* and *G. Boykiniana* are practically the same thing, as the suite before me shows. They differ from the *catenaria* in nothing but size. These four names may therefore be ranked as probable synonyms, or at best, species on probation:

G. Boykiniana Lea, 1840,+ *G. Hallenbeckii* Lea, 1862.
G. Bentoniensis Lea, 1862.
G. Couperii Lea, 1862.

All of which is respectfully submitted. Notes on any of these forms from collectors will be very acceptable to the writer.

The specimens studied are in the general collection of the Academy of Sciences and the collection of the American Association of Conchologists.

UNIONIDÆ OF GA., ALA., S. C., AND LA., IN SOUTH FLORIDA.

BY S. HART WRIGHT, PENN YAN, N. Y.

An interesting fact in geographical distribution is noted in the finding of Unionidae in Central and Southern Florida, which belong to, or were originally described as from the Central States of the South. In Volusia County, Fla., over one hundred miles south of Jacksonville and more than three hundred miles south of the middle portions of Ga. and Ala., several species of Unio have been found which were described from the latter States, or from S. C.

The St. Johns River flows northward past Volusia County, to Jacksonville and the Atlantic Ocean; and the introduction of Ga., Ala. and S. C. species against the current of the river for so great a distance is remarkable. Although the Unionidae have locomotion in a slight degree and might make headway against rivers and creeks, when once in them, they cannot thus get into waters which do not connect. Their introduction into remote regions may be through the agency of water-birds, which might carry juveniles long distances, and then drop them into new stations.

We found in Volusia Co., Fla., in 1887, the following species supposed to be transplanted from Georgia: *Unio Dariensis* Lea, *U. cicur* Lea and *Anodonta Couperiana* Lea, perhaps the most beautiful Anodonta in America, and the only one found in Florida of which we have any knowledge. We also found there, *U. modioliformis* Lea and *U. angustatus* Lea, both from South Carolina. Mr. Charles T. Simpson found in Manatee County, one hundred and fifty miles farther south and on the west side of the state, *U. obesus* Lea and *U. granulatus* Lea, from Ga. and Alabama. Mr. George W. Webster sent us a few weeks ago, a species he found in Lake Co., west of Volusia Co., which proved to be *U. hepaticus* Lea, from Ga. and S. C. *U. opacus* Lea, from Ga. and *U. nigerrimus* Lea, from La. have been reported from middle Florida. None of the species indigenous to Southern Florida, so far as we can learn, have ever been found in any of the other Southern States.

NOTES ON THE CLASSIFICATION OF AMERICAN LAND SNAILS.

BY H. A. PILSBRY.

Since the publication of my Check-list of American Land Shells, many new forms (species, varieties and absolute synonyms) have

been described, and various obscure question in phylogeny and classification have become more clear to me. It is my purpose to discuss these matters in a series of short papers.

Fischer has divided the suborder Geophila (=Stylommatophora) or stalked-eyed Pulmonates into two main branches, *Monotremata* and *Ditremata*. It seems to me that a more fundamental separation is indicated by the presence or absence of a jaw, together with the modifications accompanying this character. I would therefore primarily divide the land pulmonates into *Agnatha* and *Gnathophora*.

Superfamily Agnatha.

No jaw; teeth of the radula arranged in very oblique V-shaped rows, all of them of the aculeate or thorn-shaped form, the side-teeth larger than the central tooth, which is often obsolete.

The families of *Agnatha* are as follows.[1]

I. Mantle small, posterior; shell rudimentary or developed; a common genital orifice *Testacellidæ*.

II. Mantle enveloping the whole upper surface; no shell; genital orifices separated *Rathouisiidæ*.

The last named family is identical with the genus *Vaginulus* as understood by Stoliczka and Binney; not *Vaginulus* Fér., which as Férussac himself says has a jaw. *Veronicella* Blainv. and authors, is the same as *Vaginulus* Fér.

The *Rathouisiidæ* have been found only in India and China.

The *Testacellidæ* comprise a great variety of forms. The family is practically world-wide in distribution in tropical and subtropical regions.

Genus Glandina Schum.

Additional species and varieties.

G. truncata Gm., form *ovata* Dall. A short form, measuring 44 x 25 mm. Pliocene of the Caloosahatchie.

How does it differ from *bullata* Gould?

G. truncata Gm., form *macer* Dall. Long, narrow, but not parallel-sided, 75 x 20 mm. Recent, and fossil in the Caloosahatchie beds.

Like the form *parallela* W. G. B., these are doubtless only the extreme aspects of variation in a very mutable species.

[1] Fischer recognizes but one family, *Testacellidæ*; ignoring the agnathous Vaginulus-like forms.

SUPERFAMILY GNATHOPHORA.

Jaw present.

I. Orifices of genitalia contiguous or united *Monotremata.*

II. Orifices of genitalia widely separated; no shell; mantle covering the whole upper surface *Ditremata.*

The *Monotremata* divide naturally into two divisions:

1. Lateral teeth of the aculeate or thorn-shaped type *Vitrinea.*
2. Lateral teeth of the quadrate type *Helicea*

1. Families of Vitrinea.

a. All of the teeth aculeate *Selenitidæ.*

b. Central and lateral teeth quadrate, uncini aculeate *Limacidæ*

Selenitidæ.

This family is not very distinct from Limacidæ, but the radula is more highly specialized. Of the genus *Selenites* numerous varieties and forms have been described since the publication of my check-list. They will be enumerated later.

Limacidæ.

All attempts to split this group into two or more families have proved impracticable. The various genera exhibit every stage in the degeneration of the shell. The presence or absence of a caudal mucus gland is equally unreliable, for genera otherwise closely allied, vary in this character.

The additions to our *Limax* list being unimportant will be deferred.

Additional species of Zonites.

Z. Shimekii Pilsbry. Loess formation of Iowa and Nebraska.

Z. Simpsoni Pilsbry. Indian Territory.

A NEW SPECIES OF ARCONAIA.

BY H. A. PILSBRY.

Unio (Arconaia) Provancheriana sp. nov.

Shell wide, oblong, beaks at the anterior third. The whole shell twisted, very strongly resembling *Arca* (*Parallelopipedum*) *tortuosa* L., in the direction and degree of the twist. Hinge-line sigmoid. Anterior and posterior margins rounded; basal margin gently

curved, sigmoid; epidermis strong, olive-brown with a few darker concentric streaks; concentrically striate, nearly smooth. The left valve has a slight ridge extending from the beaks to the posterior extremity. Cavity of the left valve very shallow, of the right valve deeper; nacre purplish flesh-colored. The left valve has two widely separated cardinal teeth, lateral teeth remote from cardinals, double; right valve with single cardinal and lateral teeth. Height 32, width 53½, thickness 18 mill.

The specimen is said to be from China. It is from the collection of l'abbé Provancher, Cap Rouge, Quebec.

The ends are not produced as in *A. contorta* Lea, nor is the shell bow-shaped like that species. It can be compared with none other known to me.

[Contributed.]

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

FEBRUARY 23, 1891.

Since our last announcement the following new members have been enrolled:

139. E. R. Mayo,[1] Boston, Mass. *Massachusetts Mollusca.*

140. R. T. Shepherd, Piqua, Ohio. *Unionidae.*

141. Elwood Pleas, Dunreith, Ind. *Indiana Mollusca.*

142. Hale Montgomery, Clinton, Mo.

Nearly all of the North American Conchologists and many Palaeontologists are now enrolled in the Association, the progress of which has been very gratifying. The members are taking advantage of their privileges to correspond with each other, and much special study has been accomplished. Several of the members have undertaken the preparation of lists of species, similar to the list of Haliotidae recently published by the President. A list of the American Cypraeidae (fossil and recent) is now ready, but for want of room, will not appear until next number. Several other lists are approaching completion and we trust that it will not be long before we have complete lists of all North American mollusks.

The United States Collection.

The collection of United States shells, now being formed by the members is growing very rapidly. Many species have been added

[1] Deceased since his election.

during the past month and the specimens and suites received are magnificent. It should be borne in mind:

1st. That donating to the Collection is purely a voluntary matter on the part of members.

2d. That none but the finest kinds of specimens are accepted.

3d. That all shells must have the localities accurately designated.

4th. That consignments should be forwarded to the President, care of Academy of Natural Sciences, 19th and Race Sts., Philadelphia, at which institution the Phila. members of the Association meet at intervals, and prepare, label and mount the shells for permanent exhibition.

To avoid duplicating, it would be well for members to forward to the President lists of such shells as can be sent and he will erase the names of the species already received, and return the lists to the senders.

Donations to United States Collection.

Since last announcement, the following have been mounted and placed in the Collection. [Names of donors annexed.]

H. Moores, Columbus, Ohio.—

A lot of fresh-water shells including 12 species of Strepomatidae; 3 of Paludina; Sphaerium solidulum and transversum; Pyrgula Nevadensis, Stearns; Bythinella obtusa, Lea and Limnaea humilis, Say and exilis, Say. Also Helix clausa, Say.

E. R. Mayo, Boston, Mass.—

16 species of Marine Shells of New England, including Astarte sulcata, Costa, and castanea, Say; Chrysodomus decemcostatus, Say; Buccinum undatum, Linn. and ciliatum, Fabr.; Leda limatula, Say and thraciaeformis, Storer; Natica flava, Gld. and canaliculata, Gld., and Pecten Magellanicus, Lam.

J. A. Singley, Giddings, Tex.—

8 species of Eocene fossils from Moseley's Ferry and Wheelock, Tex., including Surcula Desnoyersii, Lea and Buccitriton Texanum, Gabb.

John Ford, Philadelphia, Pa.—

Anodonta Tryonii, Lea; Martesia cuneiformis, Say; and Lioplax subcarinata, Say.

Wm. J. Fox, Philadelphia, Pa.—

Vertigo pentodon, and Pupa corticaria, Say.

Geo. W. Webster, Lake Helen, Fla.—

A very fine lot of Florida and Tennessee shells, including the new variety "albida" of Bulimulus Dormani; Helix stenotrema, spinosa, auriculata, avara and Hubbardi; Goniobasis catenaria, Say (a handsome variety); Glandina truncata, Gmel.; Patula vortex, Pfr. and caeca, Guppy; Bythinella Monroeensis, Dall and Floridana, Fr.; Succinea luteola, Gld. and Salleana, Pfr.; Spirula Peronii, Lam.; Iphigenia Braziliana, Lam.; Marginella apicina, Menke; Iauthina globosa, Swn.; Seila terebralis, C. B. Ad.; Echinella nodulosa, Pfr.; Unio Anthonyii, Blandingianus, aheneus, amygdalum, corvunculus, and Jewettii, all of Lea.

John H. Campbell, Philadelphia, Pa.—

Haminea vesicula, Gould; Cypraea Sowerbyi; Trivia Californica and Solandri and Mangilia merita, Gld.

Geo. J. Streator, Garrettsville, O.—

Zonites ferreus, Morse; Sphaerium rhomboideum and fabalis; Ancylus rivularis, Say; and others.

Dr. G. D. Lind, St. Louis, Mo.—

Unio Higginsii, Lea and Limnaea umbilicata, C. B. Ad.

Jas. M. De Laney, Rochester, N. Y.—

One of the finest lots yet received, including Cardium consors, Sby.; procerum, Sby. and muricatum, Linn.; Calliostoma canaliculatum, Mart. and annulatum, Mart.; Pecten aequisulcatus, Cooper; Helix devius, Gld., ptychophora, A. D. Br., and Stearnsiana, Gabb; Venus gnidia, Br. & Sby.; Strombus granulatus, Wood; Bulla nebulosa, Gld.; Tellina rubescens, Ham. and Gouldii, Han.; Tapes grata, Say; Modulus cerodes, A. Ad.; and Unio luteolus. Lam., iris, Lea, and undulatus, Barnes.

Elwood Pleas, Dunreith, Ind.—

20 species of Claiborne fossils, including Marginella larvata, Conr. and plicata, Lea; Conomitra fusoides, Conr.; Limopsis declivis, Conr.; Strepsidura bella, Conr.; 3 species of Solarium; Pasithea sulcata, Lea; and Corbula nasuta, Conr.

S. Raymond Roberts, Glen Ridge, N. J.—

Helix Columbiana, Lea (collected by W. M. Gabb.)

H. A. Pilsbry, Philadelphia, Pa.—

35 species of Palaeozoic fossils from Bedford, Ind. All of them belong to the Warsaw Group. They include 4 species of Straparollus, 4 of Pleurotomaria; 3 of Rhynconella; 4 of Murchisonia; 3 of Bulimorpha; Productus Indianensis, Hall; Naticopsis Carleyana, Hall; Orthoceras epigrus, Hall; Nucula Shumardana, Hall; and 2 species of Terebratula.

E. H. Fiske, Santa Cruz, Cal.—

5 species of Post-Pliocene fossils from Santa Cruz, viz.: Purpura canaliculata and crispata; Nassa mendica, Gld.; Oliva biplicata, Sby. and Crepidula navicelloides, Nutt.

W. J. Raymond, Oakland, Cal.—

10 species of California land and fresh-water shells, including the new Sphaerium Raymondii, J. G. Cooper, and Planorbis subcrenatus, Carp., var. disjectus, J. G. Cooper, described in Proc. Cal. Acad. Science; Physa Gabbii, Tryon; Helix arrosa, Gld., armigera, Ancey and Dupetithouarsii, Desh. Some examples of the last named species introduced in 1884 into Oakland from San Simeon, San Luis Obispo Co., show a stunting of growth and slight deformity, which appear to be constant.

Elwood Pleas, Dunreith, Ind.—

6 species of Post-Pliocene shells found associated with bones of Mastodon Americanus at Losantville, Randolph Co., Ind. All of them are species yet living, viz.: Planorbis bicarinatus, campanulatus and deflectus, Amnicola porata, Pisidium compressum and Limnaea humilis.

Total to date— 199 genera, 573 species, 659 trays.

GENERAL NOTES.

Polygyra (Mesodon) Kiawaensis Simpson var. Arkansaensis Pilsbry.—These shells differ from the types of *Kiawaensis* in being larger, more robust, the aperture larger, umbilicus smaller. There are also certain anatomical peculiarities which will be described in another place. The lip of these forms is much thickened within; it

is still a very doubtful question whether the species should be referred to *Mesodon* or *Triodopsis*. The form here described seems to establish a slight bond with such shells as *Mesodon thyroides*. The specimens were collected by Mr. F. A. Sampson near Hot Springs, Ark.—*H. A. Pilsbry.*

Snail eaters.—Reading Mr. John Ford's experience with the voracious *Limax agrestis* (Nautilus No. 7, vol. IV) reminds me of another American "Cannibal."

While looking for *Glandina truncata* (in Florida) I had occasion to observe several of them chasing the *Helix Carpenteriana*, catching and devouring them, shell and all, and not only one or two of them, nay, five, six and more within a few minutes. In cleaning the specimens afterward I found nine specimens of *H. Carpenteriana* in the stomach of a single Glandina, some of the Helix yet alive.—*Dr. Fr. Stein, Indianapolis, Ind.*

EDWARD RICHARDS MAYO, AGED 82 YEARS.
Died, in Boston, Feb. 12th, of pneumonia.

Mr. Mayo was probably the oldest student of conchology in this country, being a few weeks older than his friend Dr. Wesley Newcomb. He was born in Roxbury, Mass., now a part of Boston. His occupation was book-keeping, and the last forty years of his life were spent with two firms—the great dry-goods house of A. & A. Lawrence & Co., and the law office of S. W. Dexter. When a young man he took up the study of shells, and his interest in them continued to the last. In the halcyon days of the American clipper ships and whalers, Mr. Mayo was among the first to systematically purchase the shells brought as curiosities.

He was personally acquainted with Drs. Gould, Lewis, Stimpson, Anthony and other well-known conchologists, who frequently had occasion to study the contents of his cabinet. He had also an extensive correspondence with collectors in many countries. His collection was particularly rich in foreign shells, of which he had several thousand beautiful specimens.

Mr. Mayo was a very modest man, unselfish, and to his younger fellow-students a useful friend, giving freely of his extensive information and of his specimens, and encouraging them in their pursuit of knowledge. To many readers of the Nautilus the news of his death will bring a feeling of personal loss.

Edward W. Roper.

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OF CONCHOLOGISTS.

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C. W. JOHNSON, Acting Curator Wagner Institute of Science.

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THE NAUTILUS.

VOL. IV. APRIL, 1891. No. 12.

MOLLUSKS OF THOMPSON'S LAKE, ILLINOIS.

BY W. S. STRODE, M. D., BERNADOTTE, ILL.

The beautiful *Anodonta suborbiculata* of Say has a sparse distribution and is rarely found in considerable numbers.

I know of but one locality in Illinois where it is to be found in abundance. This place is a still beautiful lake, five miles long by one in breadth, with an average depth of from five to eight feet; the bottom a mixture of black mud and sand; the shores and a hundred acres or so at each end covered with a growth of pond Lilies.

For a half century this lake has been a great fishing resort. With seines five hundred yards long, trammel and funnel nets, hook and line, spears, etc., immense quantities of fish are annually taken from its waters; great Buffalo, Cat-fish, Shovel-fish, Jack-salmon and a half dozen kinds of Sunfish, Bass, Pike and Pickerel.

State Geologist Worthen (deceased) seems to have been the only naturalist who discovered the conchological richness of the lake, and he kept the discovery to himself, collecting large quantities of the Ano. suborbiculata Say and corpulenta Cpr. and sending them to collectors and museums all over the world.

In the summer of 1890 I made a careful search for the Unionidæ and found it containing but four species: Unio anodontoides Lea, and parvus Bar., and Ano. suborbiculata Say, and corpulenta Cpr.

But the abundance of the two Anodontas make up for the lack of species. In some places the bottom of the lake seemed to be literally paved with the suborbiculata. With a six-tined potato-dig-

ger I would sometimes bring up five or six at a haul; and if the fishermen happened to be making a draw with the great seine, a half barrel of them would sometimes be drawn out at once,—many of them great beautiful adult shells nearly as large as a common dinner plate, the epidermis all intact, the stillness of the water and freedom from acid causing but little erosion. The younger shells in their beautiful iridesence, seem to have caught the tints reflected from the green woods, the blue sky and sparkling stars.

The other Anodonta, the corpulenta was not so plentiful in the deeper water that the suborbiculata seemed to prefer, but nearer the shores in shallow water, more or less shaded by the broad leaves of the water lily, many of them could be found. The umbones of this mussel, as found in this lake, more nearly approach perfection than in any other species.

Associated with this mollusk, among the water lilies, were great numbers of Vivipara contectoides Binney and intertexta Say and also more or less of the Physa heterostropha Say.

In collecting and handling these fragile shells much care must be taken as they break as easily as egg shells. When removed from the water I would pile them up in one end of the boat, and cover them up from the sun with a wet blanket. When transferred to my buggy (for I had to drive twenty miles to Bernadotte) I would first line the bottom of the bed with wet grass, on which I arranged the mussels and then again covered them up well with the wet blankets. On reaching home they were at once transferred to a large tub containing water. They must be cleaned without the use of hot water and immediately given a good bath of glycerine, and then kept in a cool place.

DESCRIPTION OF NEW SPECIES OF ANCTUS AND OLIVA.[1]

BY JOHN FORD, PHILADELPHIA.

Anctus Pilsbryi Ford. Fig. 1.

See THE NAUTILUS iv, p. 81, 1890; Proc. Acad. N. S. Phila. 1891, p. 81.

Shell rimately umbilicated, the axis imperforate; ovate-conical, spire acute, apex black; whorls 7, slightly convex, the last some-

[1] Reprinted by permission, from Proc. Acad. Nat. Sci. Phila. 1891, pp. 97, 98.

Fig. 1.

what contracted near the base. Aperture extremely narrow, oblong; lip flatly reflected, the central half of its length provided with a flange extending towards the inner or columellar lip, from which proceeds a corresponding convexity, thus giving to the aperture a form much like the traditional key-hole. Color grayish-white, painted longitudinally with brownish and black lines.

Length of shell 23, diameter 9½ mill. Width between flanges 1, width of flange on outer lip 2 mill. Color of lip white; aperture slightly shaded within. Habitat, Brazil.

Anctus angiostoma Wagner (*capucira* Spix), Fig. 2, and *A. Pilsbryi* are the only living species of the genus known, and both are in color pattern and general form very much alike. In the former species, however, the apex is not black and shining as in the latter nor are the apertures at all alike save in general outline. Indeed, that of *A. Pilsbryi* is absolutely distinct from any other known to the writer. This alone would justify its specific separation.

Fig. 2.

The figures were drawn from photographs of the shells and may therefore be accepted as correct.

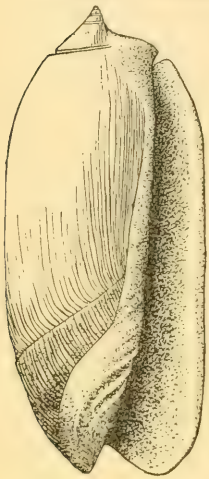
The species has been named in honor of my friend Mr. Henry A. Pilsbry, Conservator of the Conchological department of the Academy and present Editor of the "Manual of Conchology."

Oliva cryptospira Ford. Figs. 3, 4.

Shell cylindrical, slightly enlarged near either end, producing an obese appearance. Salmon-colored, with a few dashes of white accompanied by faint zigzag brownish lines showing through the enamel, the latter being somewhat thickened and more orange in color on the basal fasciole. Spire short, *with sutures entirely concealed by a heavy callus.* Edge of lip and interior of aperture white. Length of type specimen 2¼ inches. Greatest diameter 1 inch. Habitat, Moluccas.

This shell is probably well known to veteran collectors, since it has been posing for many years as a variety of *O. irisans* Lamarck, from which species, however, it is in fact distinct.

No figure was given with Lamarck's description of *O. irisans*, but a figure probably intended for the same shell appears in Reeve's "Conchologia Iconica," Vol. 6, Pl. 6, fig. 8a, where it is classed with typical *O. irisans* Lam. That this figure does not agree with Lamarck's description in any essential features is quite apparent.



Figs. 3.

It seems, however, to have been accepted by my late friend, Mr. Tryon, as well as by Reeve, for a form of *O. irisans*, since it was copied for the "Manual" without remark; although several specimens exhibiting characters similar to those shown in the figure—but which belong to *O. cryptospira* only—were at the time in the Academy's collection. Whether these specimens were accidentally overlooked, or the distinctions noted deemed too trifling for special designation, is a question that cannot now be answered.

In consequence of this uncertainty, the responsibility of correcting the error of classing this form with *O. irisans*, (if error it be), is accepted rather reluctantly although in the firm belief that the change will benefit the student, as well as, in some slight degree, the cause of Science, also.

Fig. 4.

WESTERN PENNSYLVANIA SHELLS.

BY E. H. HARN, BLAIRSVILLE, PA.

The following is a list of species which I have collected in Western Pennsylvania. It may be of interest for the sake of locality:

Selenites concavus Say.
Zonites fuliginosus Griff.
Zonites laevigatus Pfr.
Zonites ligerus Say.
Zonites intertextus Binn.
Zonites inornatus Say.
Zonites nitidus Müll.
Zonites arboreus Say.
Pupa armifera Say.
Pupa contracta Say.
Ferussacia subcylindrica Linn.
Succinea obliqua Say.
Succinea avara Say.
Succinea Totteniana Lea.
Campeloma rufa Hald.
Planorbis bicarinata Say.

Zonites indentatus Say.
Zonites milium Morse.
Zonites fulvus Drap.
Zonites suppressus Say.
Zonites multidentatus Binn.
Patula solitaria Say.
Patula alternata Say.
Patula perspectiva Say.
Patula striatella Anth.
Patula lineata Say.
Helix labyrinthica Say.
Helix hirsuta Say.
Helix monodon Rack.
var. fraterna Say.
Helix palliata Say.
Helix tridentata Say.
Helix albolabris Say.
Helix Pennsylvanica Say.
Helix exoleta Binn.
Helix dentifera Binn.
Helix thyroides Say.
Helix profunda Say.
Helix pulchella Müll.
Helix pulchella Müll.
var. costata Müll.
Helix nemoralis Müll.
Pupa fallax Say.
Planorbis (? var.) Harni Pils.
Carychium exiguum Say.
Unio aesopus Green.
Unio alatus Say.
Unio circulus Lea.
Unio clavus Lam.
Unio crassidens Lam.
Unio cylindricus Say.
Unio gibbosus Barnes.
Unio fabalis Lea.
Unio iris Lea.
Unio Kirtlandianus Lea.
Unio ligamentinus Lam.
Unio multiradiatus Lea.
Unio mytiloides Raf.
Unio obliquus Lam.
Unio occidens Lea.
Unio parvus Barnes.
Unio phaseolus Hindr.
Unio pustulosus Lea.
Unio rectus Lam.
Unio securis Lea.
Unio subovatus Lea.
Unio subrotundus Lea.
Anodonta undulata Say.
Margaritana marginata Say.
Margaritana rugosa Barnes.
Margaritana undulata Say.

EDIBLE MOLLUSKS OF RHODE ISLAND.

BY HORACE F. CARPENTER, PROVIDENCE, R. I.

I have read with much interest the article in the January NAUTILUS by Prof. Keep and its supplement by Henry W. Winkley in the February number and am tempted to add a short article on the edible mollusca of Rhode Island. I think in point of numbers of species, as well as individuals, Rhode Island will excel any state in the Union. As we have seen California has but five species and Maine only four regulars and two occasional, while Rhode Island can show eight every day and five irregular as below.

Mya arenaria Linn. Rhode Island is the metropolis of the clam both in production and consumption. The Rhode Island clam bake is a peculiar institution known all over the country. From June to September every day sees hundreds of bushels consumed at the various shore resorts, called here "down the river;" and there are several places in Providence where steamed clams are served in the shell every day in the year. The beds are inexhaustible and the more they are dug over, the faster they seem to propagate.

Ostræa Virginica Gmel. and *Ostræa borealis* Lam. are both very abundant and are consumed in great quantities. *O. Virginica* are brought here from the South in schooner loads and planted in the bay to grow, while *O. borealis*, the finest oyster in the world, is native to our shores.

Venus mercenaria Linn. is also very abundant and can be seen in our markets at all times.

Mactra solidissima Chem. is abundant on the ocean shores and is used by the natives for making chowders.

Pecten irradians Lam. There are about two hundred boats engaged in scallop dredging and each boat is allowed by law to take only twenty-five bushels per day from September 1st to April 1st, making only five thousand bushels per day for seven months in the year. The adductor muscle only is eaten, while the rest of the animal (the "rim," so called) is thrown away. If cats are allowed to eat the rims their ears drop off. This fact is well known to all scallop dredgers and a good many earless cats can be seen at Pawtuxet and East Greenwich at any time, caused by eating scallop "rims" of which they are very fond.

Mytilus edulis Linn. is also a common article of food, both boiled and pickled.

Littorina littorea Linn. is very abundant and is relished by English people who had become accustomed to them in the old country.

Ensatella (or *Ensis*) *Americana* Gould is quite plenty and is eaten by the dwellers on the shore.

Buccinum undatum Linn. and *Pecten tenuicostatum* M. & A. are found only on the ocean shores and at Block Island and are eaten whenever they can be obtained, but they are not very plenty here.

Neverita duplicata Say and both the *Fulgurs, carica* and *canaliculata* are occasionally thrown into a clam bake, and I have seen them eaten, but never indulged personally. I should think they would prove rather tough.

The fresh water clams, *Unio* and *Anodon* were formerly eaten by the Narragansett Indians, but I never knew of any white man hungry enough to try them.

ON PUPA RUPICOLA SAY, AND RELATED FORMS.

BY DR. V. STERKI, NEW PHILADELPHIA, OHIO.

This group of American Pupa is most interesting, but little known as yet. As in Europe the Pupa group *Torquilla* reaches its maximum development in numbers and forms in the countries around the Mediterranean, so in America the group of *Pupa rupicola* inhabits the West Indies and the mainland bordering the Gulf of Mexico, the Mediterranean of America. The American forms ranging under this group are much smaller than those of the Eastern continent—scarcely any exceeding 3 millimetres in altitude—and probably there are fewer species; yet scarcely less interesting are they, and well worthy of special study.

A very prominent feature of this and related groups is the apertural lamellae, of which I prefer saying more in another article specially on this subject. As the lamellar characters are nearly the same in the forms to be considered, and even some variations are found almost alike in all, we need not describe them specially in every species, as they are only of secondary value in differential diagnosis. It must be stated here, however, that a general characteristic is the particular development of the apertural lamella, which is long and more or less complex, and another the diversity of the inferior palatal being more or less distant from the margin, and of decidedly different direction and shape—in part of different morphological value.

In the following I intend communicating only a few systematic faunistic notices concerning those species inhabiting our country, not to give full descriptions and synonymy, leaving that for a "revision" of the North American Pupidae. Some of our forms have so universally been misunderstood that a rectification, as far as possible, will be justified.

Pupa rupicola Say.

It is characterized by its turriculate shape, with rather pointed apex, pale straw color, with thickened, white lip; aperture with

little marked sinuosity at the outer upper angle; lamellæ: apertural, more simple than in some other species; inferior palatal placed and shaped as usual.

This well defined species has been found from South Carolina and Florida to Louisiana, always near the coast. I have not seen it from the West Indies.—Synonymy and references will be found with the following:

Pupa procera Gould.

When Dr. Gould published this species,[1] he knew it only from Baltimore specimens. Subsequently it was considered identical with *P. rupicola* Say. After having examined and compared many hundreds, even thousands of examples of both species, I came to the conclusion that they are quite distinct; and I never saw a doubtful or intermediate specimen. The author's description leaves no doubt as to the identity of the species.

P. procera is characterized by its cylindrical, rather strong shell with obtuse apex, the uniformly brownish horn to chestnut color, and the form of the aperture; one peculiar feature which has been pointed out by Gould,[2] is the deep seated and rather transverse inferior lamella in the palatal wall.

In Binney Terr. Moll. II, p. 339, under the head *P. rupicola*, the description is of *P. procera*, and so are the figures of the aperture; the same is in W. G. B. Bulletin No. 28. In Gould (W. G. Binney edit.) Mass. Invertebr. 1870, under *P. rupicola* Say, the description is of *P. procera*, while the figure represents *rupicola*. There is no doubt but that Mr. W. G. Binney, as well as Pfeiffer and others, had not a sufficient number of good specimens before them, of one or either species, or they would have arrived at a different conclusion.

Our species is the only one of the subgenus living remote from the sea in the interior of the continent. It is distributed over a great part of our country. Its area is from New England and South Carolina to Minnesota and Texas, and in this whole region it is remarkably constant. Only some Iowa and Minnesota examples, from Winona, are somewhat smaller and more delicate, the apertural lamella showing a more marked configuration.

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[1] Monograph of . . . Pupa, Boston Journ. III, p. 401, pl. 3, f. 12; IV, pl. 16, f. 12, and p. 355.

[2] l. c.

Pupa hordeacea Gabb.

There has also been much uncertainty about this form, since under its name no less than 3, and possibly more, different ones have been sent out by the author himself, and the descriptions published of it did not agree at all.[1] Yet it has been decided to let the name stand for a species related to *procera*, but having the shell larger (averaging alt. 3·0 diam., 1·3 millim.), the aperture of a different, somewhat rhombic shape; the crest behind the palatal margin is more or less white, corresponding to a rather strong callus; the palatal wall just behind the crest is considerably flattened, and the base rather compressed, keel-like.

P. hordeacea is decidedly variable; among the typical form there are numerous albino specimens; some show hardly a trace of a lamella on the palatal wall; from certain parts of its range, there are examples more conical and somewhat lighter colored, approaching *P. servilis* Gould. The species is found in Texas, New Mexico and Arizona. As already mentioned, it comes very near *P. procera* on one side, and shows much resemblance to *servilis* on the other, while it has a well characterized "strain" of its own. But with these interrelations, it is all the more interesting to the naturalist who desires something else than simply filing so and so many "well defined" species only.

Pupa hordeacella Pilsbry.

There is hardly a controversy about the synonymy of the species. It is characterized by its size, averaging the smallest of the group on the continent, the thin shell, its distinct striation, the flattened last half of the body whorl, the base being comparatively broader and more rounded than in its congeners and by the thin apertural margins. But it is also variable to a considerable degree; as to size, the smallest I have seen measuring 1·4, the largest 2·4 millim.; as to color, from pale horn to light chestnut; and pure albinoes are quite common in some places. The smallest specimens generally have a remarkably lesser number of whorls comparatively.

Its area of distribution, as far as known, is from Florida through Mississippi and Texas to New Mexico and Arizona.

[1] Since the original description (Am. Journ. Conch. II, Oct., 1866, p. 331) was inaccessible to me, Mr. Dall had the very estimable kindness to forward me a copy of it and of the figure; from both it would be absolutely impossible to identify the species.—Conf. also W. G. Binney, Bulletin 28, p. 173.

Pupa servilis Gould.

A West Indian species, which has been reported from Louisiana and Texas; whether it is really living on the continent I am unable to decide. Among the many collections examined I never found it from our country.

I prefer the above name, since the description given with it corresponds exactly with the form taken for it, while that of *P. pellucida* Pfr. does not at all agree with the same, but quite well—as far as it goes—with some other forms from the West Indies.

Pupa ————.

For completeness I wish to give short notice here of a very interesting form, collected at our limits, at Hidalgo, Texas, by Mr. J. A Singley. It resembles much the *P. servilis* of Gould, in size and appearance. But by careful examination a few features are found quite new and seen in none of the other continental forms of the group, viz., the presence of an infra-apertural lamella, between the "apertural" and the columella, and the inferior palatal lamella being very long and of particular shape. Both these characters I have seen also in some forms from Curacoa, in the collection of Mr. W. G. Mazyck. Although this Pupa must be considered as specifically distinct, I prefer not naming it before, if possible, comparing other, probably related ones, from Central America and the West Indies.

A few words must be added concerning the geographical distribution of the species in question.

P. rupicola and *procera* I have seen together only in one instance, in a lot from "South Carolina," where there was one example of the former among a number of the latter. But it was much to my satisfaction, a thing I had long looked for. It is evident that reports of *P. rupicola* Say, having been collected in the interior of the continent, say North and West of a line drawn from South Carolina to Louisiana, possibly also a part of southern Texas, are with all probability to be referred to *P. procera* Gould.

P. rupicola and *hordeacella* have been collected together in many places of Florida (by Messrs. Dall, Stearns, Hemphill, Webster, A. G. Hinkley, *et. al.*), and in Mississippi (Pass Christian, by Mr. Bryant Walker), while at and near Charleston, South Carolina, the former seems to be alone (Mr. W. G. Mazyck.)

In middle Texas (Lee Co., Mr. Singley) *P. hordeacella*, *hordeacea* and *procera* are found together; in lots from Comal County, (drift,

also collected by Mr. Singley) the same three were represented, but *procera* in small number. Among about 60 specimens from Hidalgo, Texas, (Mr. Singley, coll., sent by Mr. Wm. A. Marsh) there were *P. hordeacella*, *hordeacea* in a form somewhat differing from the type, and the species mentioned above; *P. procera* wanting.

From New Mexico I have seen *P. hordeacea* and *hordeacella*. Texas seems to be the center of distribution of the group under consideration on our continent, and there is no doubt but that more valuable things will be found in that state and the neighboring territories.

My own collection now contains about 65 numbers (75 vials) of the forms named above (except *P. servilis*) from the continent, and many more I have seen in other collections.

The title of this article may appear to be not fully appropriate, in so far as the species named there is the one, or one of the furthest removed from the common type of the whole group. Yet *P. rupicola* Say is the oldest and best known name, and, I think, the choice of it may be justified.

[CONTRIBUTED.]

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

SANTA BARBARA, CAL., FEB. 3, 1891.

To the President of the American Association of Conchologists:

DEAR SIR:

In response to your circular card of November 7, notwithstanding the probability that you may consider my response as coming too late, I venture to make a few remarks:

I regret to see the evident tendency among conchologists who are coming into print, to make radical and uncalled for changes in nomenclature.

I have noted more particularly those relating to our West Coast shells.

We, who have been for the past twenty-five or thirty years, accustomed to the names by which our mollusks have been known, fail to see the necessity or utility of making so many changes, especially by those not resident, nor especially interested in our local conchology, which renders our standard publications next to useless, places difficulties in the way of young students, puzzle and annoy our older naturalists, and have a tendency to fence in the field of

knowledge from many who would enter, if the way was not so beset with the thorns of synonyms and unnecessary divisions of genera.

If we were laboring along under huge and glaring inconsistencies, we would meekly submit to correction.

It would seem, that the only persons benefitted by this state of things are, those who make and support these changes in order to increase their catalogues of species and varieties * * * * by the addition of the so-called new varieties and the adoption of new names for old and well known species; or, those teachers of science who are in receipt of salaries and can thus afford to devote their whole time to one subject, or those who are anxious to air their knowledge by the use of hard names and the division of well known genera into as many sub-genera as possible.

The one great object of the teacher should be to make the road as easy as possible to his pupils and followers, whereas the real object of many would seem to be exactly the reverse, and instead of removing the stumbling blocks and smoothing the rough places, some of them seem intent upon making a hard road still more difficult.

For example—the name Helix is getting to be pretty well known as the scientific name for Snails, and in the index to "Land and Fresh Water Shells of North America" by Binney and Bland, published in 1869, we find 341 specific names including recognized species and synonyms, under the generic name of "Helix," whereas in later publications we find this simple genus has been divided into thirty or forty sub-genera, the names of which convey no idea to the student, who is confronted by the substituted and, to him meaningless words, such as *Helminthoglypta*, *Micrarionta*, *Euparypha*, etc.[1] as applied to the poor innocent Snails, of which my esteemed friend Dr. Stearns says, "there is neither propriety nor advantage in their use." I note also, that some of our writers * * * * * * * * * * while proposing to cut down the number of species and varities of the Land Shells of other faunal regions, are hard at work manufacturing names for additional species and varieties in their own region, Yea verily, "Consistency thou *art* a jewel." * * *

To illustrate what we may expect if this genus, species, and variety making continues, I will instance the way in which some of the small provinces and countries manufacture varieties of postage stamps for the express purpose of selling them to stamp collectors.

[1] The *number* of subgenera attributed to Mr. Binney is liberally estimated. Mr. B. never used the names *Helminthoglypta* or *Micrarionta*.—Ed.

In some of these countries the amount realized from sales to collectors exceed the amount of revenue derived from their use for postal purposes, and when they desire to increase their revenue, they strike off a lot of "New Issues," or, by printing a different value on the "Old Issues," and placing an additional charge upon them meet with large sales. They even go so far as to deliberately make errors in these so-called "Surcharges" and thus create a demand for these manufactured "rarities," which seems to me to be a parallel case with some dealers and others interested in the Conchological Exchange.

LORENZO G. YATES.

GENERAL NOTES.

The Boston Society of Natural History has purchased from Mr. Gulick a valuable series of several hundred Hawaiian Achatinella. Those from the island of Oahu, are to be mounted on a large model of that island, made by J. H. Emerton. They will occupy their respective localities on the mountains and in the valleys, and will illustrate the progression and variation of species from the various centers. I have suggested to the Curator that a similar model be made to show the distribution of the *Patula strigosa* group taking Hemphill's fine series as a basis.—*E. W. Roper, Revere, Mass.*

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